



ಲೋಕೋಪಯೋಗಿ, ಬಂದರು ಮತ್ತು
ಒಳನಾಡು ಜಲ ಸಾರಿಗೆ ಇಲಾಖೆ

(ರಾಷ್ಟ್ರೀಯ ಹೆದ್ದಾರಿಗಳ ವಲಯ)

Public Works, Ports and
Inland Water Transport Department
(National Highway Zone)



ರಾಷ್ಟ್ರೀಯ ಹೆದ್ದಾರಿ ವೃತ್ತ, ಬೆಂಗಳೂರು

2018-2019 ನೇ ಸಾಲಿನ ದರಗಳ ಪಟ್ಟಿ

SCHEDULE OF RATES, NATIONAL HIGHWAY CIRCLE
BANGALORE FOR THE YEAR 2018-19



Arkavathi Bridge at KM 45.22 on NH 948

ಅಧೀಕ್ಷಕ ಅಭಿಯಂತರವರ ಕಛೇರಿ

ರಾಷ್ಟ್ರೀಯ ಹೆದ್ದಾರಿ ವೃತ್ತ, ಬೆಂಗಳೂರು

OFFICE OF THE SUPERINTENDING ENGINEER
NATIONAL HIGHWAY CIRCLE, BANGALORE

ಕರ್ನಾಟಕ ಸರ್ಕಾರ
Government of Karnataka

ಲೋಕೋಪಯೋಗಿ, ಬಂದರು ಮತ್ತು
ಒಳನಾಡು ಜಲಸಾರಿಗೆ ಇಲಾಖೆ
(ರಾಷ್ಟ್ರೀಯ ಹೆದ್ದಾರಿಗಳ ವಲಯ)

**PUBLIC WORKS, PORTS AND
INLAND WATER TRANSPORT DEPARTMENT
(NATIONAL HIGHWAYS ZONE)**

ರಾಷ್ಟ್ರೀಯ ಹೆದ್ದಾರಿಗಳ ವೃತ್ತ, ಬೆಂಗಳೂರು
2018-2019ನೇ ಸಾಲಿನ ದರಗಳ ಪಟ್ಟಿ

**SCHEDULE OF RATES OF NATIONAL HIGHWAYS CIRCLE
BANGALORE FOR THE YEAR 2018-2019**

ಅಧೀಕ್ಷಕ ಅಭಿಯಂತರವರ ಕಛೇರಿ,
ರಾಷ್ಟ್ರೀಯ ಹೆದ್ದಾರಿಗಳ ವೃತ್ತ, ಬೆಂಗಳೂರು.

**OFFICE OF THE SUPERINTENDING ENGINEER,
NATIONAL HIGHWAYS CIRCLE, BANGALORE.**

**THIS SCHEDULE OF RATES IS APPLICABLE
FOR NATIONAL HIGHWAY WORKS ONLY**

**ಈ ದರಪಟ್ಟಿಯು ರಾಷ್ಟ್ರೀಯ ಹೆದ್ದಾರಿಯ
ಕಾಮಗಾರಿಗಳಿಗೆ ಮಾತ್ರ ಅನ್ವಯಿಸುತ್ತದೆ.**

FOREWORD

The Schedule of Rates of National Highway Circle,, Banglaore is to be updated for the year 2018-19 due to variations in cost of Bitumen, Cement, Aggregates, Steel, Fuel, other Consumables, Labour & Hire charges of Machinery and for the incorporation of 5th revisison specification to prepare detailed realistic estimates. The Schedule of Rates should be updated based on the Ministry's Standard Data Book and latest Specification of Roads & Bridges V Revision issued by the Ministry of Shipping, Road Transport & Highways on 30.01.2013. This work involves lot of efforts by group of members. Hence, a Sub-Committee has been constituted by the Superintending Engineer, National Highways Circle, Banglaore. The members of the Sub Committee are:

- | | | |
|----|---|----------|
| 1. | Sri. K.P. Mahadevaiah
Executive Engineer,
National Highway Division,
Tumkur. | Chairman |
| 2. | Smt. R Hemalatha
Executive Engineer,
National Highway Division,
Bangalore. | Member |
| 3. | Sri. V.R. Subbarama Holla
Executive Engineer,
National Highway Division,
Mangalore. | Member |
| 4. | Sri. N. Shivakumar
Executive Engineer,
National Highway Division,
Chitradurga. | Member |
| 5. | Smt. D. Archana
Executive Engineer,
National Highway Division,
Hassan. | Member |

-
- | | | |
|------|---|----------|
| 6. | Sri. H. Sudarshana Murthy
Technical Assistant
National Highway Circle,
Bangalore. | Convener |
|
 | | |
| 7. | Sri. P. R. Mohanlal
Assistant Executive Engineer,
National Highway Sub-Division,
Bangalore. | Member |
|
 | | |
| 8. | Sri. K.M. Sachidananda Mruthy
Assistant Executive Engineer,
Quality Control Sub-Division,
National Highway, Bangalore | Member |
|
 | | |
| 9. | Sri. S. Chandrashekar
and
Sri. G.P. Lakshmi Narayana. Rtd.
Assistant Engineer II
National Highway Circle,
Bangalore. | Members |

The Sub-Committee members have made valuable contribution in bringing out this updated Schedule of Rate for the year 2018-19 of National highway Circle, Bangalore. They have carried out modification in rates, in conformity with the latest Specification for Roads & Bridges V Revision issued by the Ministry of Shipping, Road Transport & Highways.

I am greatfull to **Sri. M. Ganesha, Chief Engineer**, National Highways, Bangalore for the contribution extended by him for finalisation of updated schedule of rates. I appreciate valuable suggestions and dedicated service rendered by all the Sub-Committee members in bringing out this updated schedule of rates for the year 2018-19.

Date: 31.01.2019

Place: Bangalore

Sd/-
RAGHAVAN
Superintending Engineer.
National Highways Circle,
Bangalore.

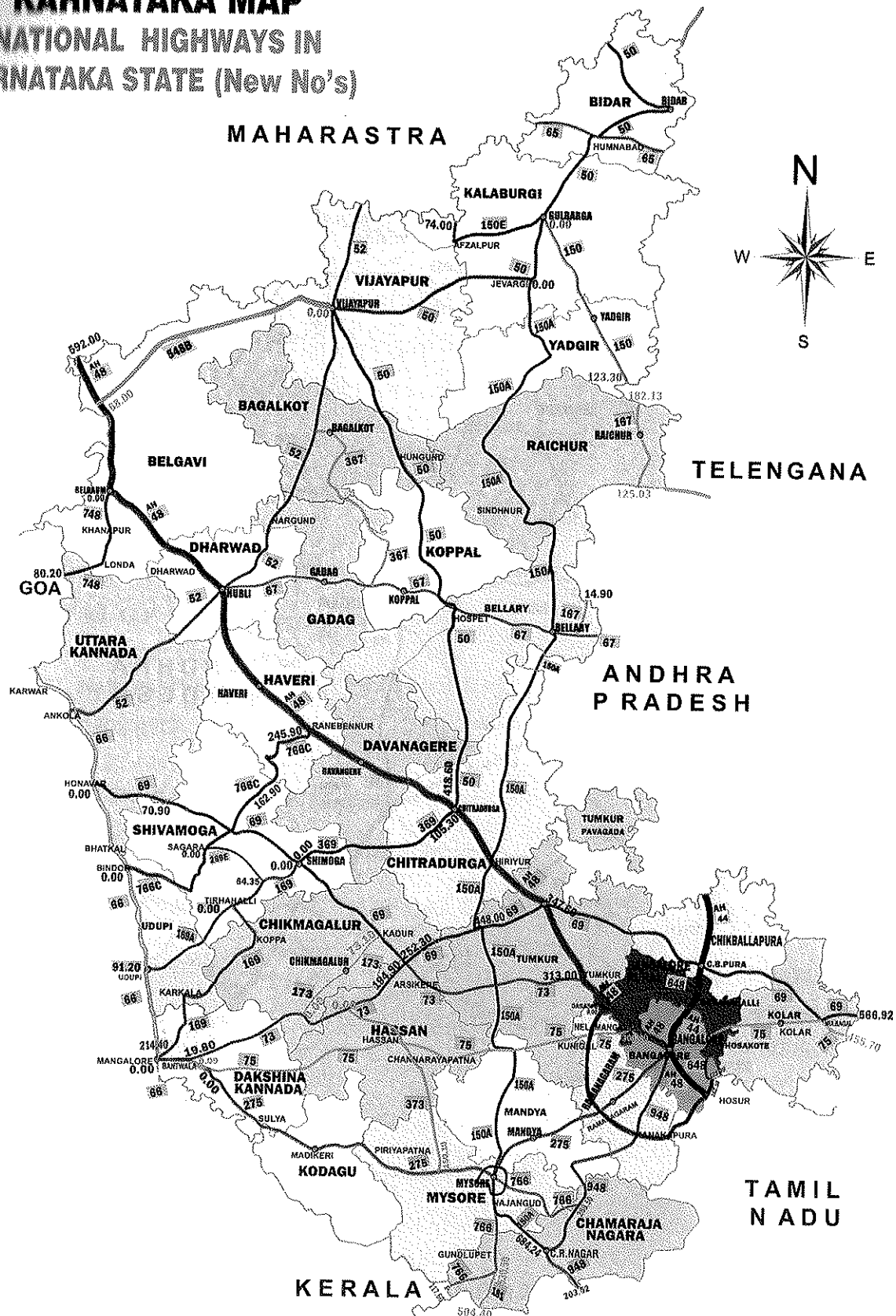
KARNATAKA MAP

NATIONAL HIGHWAYS IN KARNATAKA STATE (Old No's)



KARNATAKA MAP

NATIONAL HIGHWAYS IN KARNATAKA STATE (New No's)



NATIONAL HIGHWAY'S IN BANGALORE CIRCLE

Length in K.M

NH Nos	Description of road	Section	Length	NH zone	NHAI	Local bodies	Over Lap
44	The highway starting from its junction with NH1 near Srinagara - Penugonda in AP state, AP-Karnataka state Border - CB Pura - Devanahalli - Bangalore - Kar-TN state border - Hossur - Krishnagiri - Kanyakumari (Kape Camaron) in TN state. Longest road	CB Pura - Bangalore - Hosur	134.00	---	116.00	18.00	---
48	The highway starting from its junction with NH44 near Delhi - State border - Belgam - Hubli - Ranebennur - Chitradurga - Hiriyur - Tumkur - Bangalore - Hosur - Krishnagiri - and terminating at the junction with NH 16 near Chennai in TN (old Ch) This road overlaps from Bangalore to Krishnagiri via Hosur.	Belgam - Bangalore - Hosur	622.25	---	582.00	10.00	30.25
50	The highway starting from its junction with NH161 in AP state connecting Bidar - Humnagad (NH65) - Gulbarga - Jeevarge - Bijapur - Hospet - and terminating at the junction with NH 48 near Lakshmisagara (Chiradurga) in Karnataka.	Humnagad (NH65) - Gulbarga - Jeevarge - Bijapur - Hospet - Lakshmisagara (Chiradurga) Section	125.10	---	125.10	---	---
66	The highway starting from its junction with NH48 near Panvelin Maha rastra - Panjim - Karwar - Kundapura - Udupi - Mangalore - Kasaragod - Tiruvananthapuram in Kerala state and terminating at the junction with NH 44 near Kanyakumari in TN state.		154.20	---	150.60	3.60	---

NH Nos	Description of road	Section	Length	NH zone	NHAI	Local bodies	Over Lap
69	The highway starting from its junction with NH66 near Honnavara - Sagara - Shivamoga - Kadur - Banavara Junction - Hulyar - Sira - Madugiri - CB Pura - Chintamani - Srinivasapura - Mulabagal - Karnataka.AP State Border Palmaner and terminating at the junction with NH 40 near Chittor in AP state.	Honnavara - Sagara - Shivamoga - Kadur - Banavara Junction - Hulyar - Sira - CB Pura - Mulabagal - Palmaner Chittor AP	553.20	466.20	87.00	---	---
73	The highway starting from its junction with NH66 near Mangalore connecting Bantwala - Belthangady - Mudigere - Belur - Banavara - Arasikere - Tiptur - and terminating at the junction of NH 48 near Tumkur	Mangalore (Pump well) - Bantwal (BC Road) - Mudigere - Belur - Banavara - Arasikere -Tumkur Section	313.00	181.10	129.10	2.80	---
75	The highway starting from its junction with NH73 near Bantwal-Sakakeshapura-Hassan-Kunigal-Nelamangala Junction (NH) Bangalore - KR puram - Hosakote - Kolar - Mulabagal - Kar - AP border - V Kota - Pernampet - Gudiyattam - Katapadi - and terminating at the junction of NH 48 near Vellur (TN)	Bantwal (BC Road) - Hassan - Kunigal - Nelamangala - Bangalore section	455.70	48.00	371.00	18.50	18.30
150A	The highway starting from its junction with NH50 near Jeevarge connecting Siraguppa - Bellary - Hiriya - Hulyar - CN Halli - Nagamangala - Srirangapatna - Mysore - Nanjanagudu and terminating at the junction with NH 948 near CR Nagara in Kar state.	Jeevargi - Bellary - Hiriya - SR Patna - CR Nagara section.	485.00	294.80	149.00	---	41.50

NH Nos	Description of road	Section	Length	NH zone	NHAI	Local bodies	Over Lap
167	The highway starting from its junction with NH67 near Hagari connecting Alur - Adoni - Mantrayalayam - in AP state connecting Raichur Mahabub nagar and terminating at the junction with NH 44 near Jedcherla in AP state.	Bellary Hagari Raichur section	71.40	71.40	---	---	---
169	The highway starting from its junction with NH69 near Shivamoga - Thirthahalli - Sringeri - Koppa - Karkala and terminating at the junction with NH66 near Mangalore,	Shivamoga - Thirthahalli - Sringeri - Koppa - Karkala - Mangalore section	214.40	214.40	---	---	---
169A	The highway starting from its junction with NH169 near Thirthahalli and terminating at the junction with NH66 near Udupi (Malpe)	Thirthahalli - Udupi Section	91.20	91.20	---	---	---
173	The highway starting from its junction with NH73 near Mudigere - Chickmagalur and terminating at the junction with NH63 near Kadur	Mudigere - Chickmagalur - Kadur Section	73.10	73.10	---	---	---
181	The highway starting from its junction with NH81 near Coimbatore connecting Meetupalyam - Udagamamdalam (Ooty) - Gudalur - TN Kar state Border - and terminating at the junction with NH766 near Gundlupet in Karnataka	Coimbatore - Meetupalyam - Udagamamdalam (Ooty) Gundlupet	26.10	26.10	---	---	---
275	The highway starting from its junction with NH75 near Bantwal-Puttur-Sulya - Madikeri-Periyapatna -Mysore-SR Patna - Mandya-Channapatna -Ramanagara- and terminating at the junction with NH75 near Bangalore.	Bantwal (Mani) - Sulya - Madikeri - Mysore -Ramanagara - Bangalore Section	348.35	217.60	117.90	12.80	---

NH Nos	Description of road	Section	Length	NH zone	NHAI	Local bodies	Over Lap
369	The highway starting from its junction with NH69 near Badravathi connecting Chennagiri - Holalkere and terminating at the junction with NH 48 near Chitradurga in Kar state.	Badravathi (Shivmoga) - Chennagiri - Holalkere - Chitradurga Section	105.30	105.30	---	---	---
648	The highway starting from its junction with NH 48 near Nelamangala (Dabaspeta) - DB Pura - Devanahalli (NH44 Jn) - Hosakote - Sarjapura - Bagalur in TN and terminating at the junction with NH 48 near Hosur.	Dabaspeta - DB Pura - Devanahalli - Hosakote - Sarjapura - Hosur Section	122.30	40.50	81.30	---	0.50
766	The highway starting from its junction with NH66 near Kozikode (NH66) - Kalapetta in Kerala state - Gundlupet - Nanjanagud - Mysore - and terminating at the junction with NH 948 near Kollegala in Kar state.	Kozikode - Gundlupet - Nanjanagud - Mysore - Kollegala Section	150.9	150.90	---	---	---
766C	The highway starting from its junction with NH66 near Baindur - Kollur - Hosanagara - Anandapura - Shikaripura - Masur and terminating at the junction with NH 48 near Ranibennur in Kar state.	Bindur - Kollur - Hosanagara - Shikaripura - Ranibennur Section	246.00	246.00	---	---	---
948	The highway starting from its junction with NH48 near Bangalore connecting Kanakapura - Malavalli - Kollegala - Chamarajanagar in Karnataka state and terminating at the junction with NH544 near Coimbatore in TN state.	Bangalore - Kanakapura - Kollegala - Chamarajanagar - Satyamangalam - Coimbatore - Section	195.5	134.25	61.25	---	---

NH Nos	Description of road	Section	Length	NH zone	NHAI	Local bodies	Over Lap
275K	The highway starting from its junction with NH275 near Hinkal village connecting NH 275/ NH 150A near Columbia Asia Hospital - NH766/ NH150A near APMC Bandipalya and terminating at originating junction with NH 275 near Hinkal village around Mysore city in Kar state (Mysore ring road)	Mysore Ring road Section	41.67	41.67	---	---	---
369E	The highway starting from its junction with NH69 near Sagara - Huluvenahalli - Holebagalu - Kalasavalli - Sigandanoor and terminating at the junction with NH 766C near Marakutaka in Kar state,	Sagara - Sigandhanoor - Marakutaka	64.35	64.35	---	---	---
NEW 373	The highway starting from its junction with NH73 near Belur connecting Hassan - HN Pura - KR Nagara and terminating at the junction with NH275 near Bilikere in Kar state.	Belur - Hassan - HN Pura - KR Nagara - Bilikere Section	150.13	150.13	---	---	---
NEW 948A	The highway starting from its junction with NH 648 & NH 48 near Dobaspet (Manne) - Nijagal - Kengal - Gudemaranahalli - Harti - Melahalli - Hulikere gunnur - Rayasandra - Banavasi - Tokkasandra in Kar state - connecting Achepatti - Alur - in TN state and terminating at the junction with NH 648 near Sarjapura (Bangalore ring road)	Bangalore Ring Road	162.10	---	162.10	---	---
			4659.00	2617.00	2132.00	65.00	90.00

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GOVERNMENT OF KARNATAKA

(Public Works, Ports and Inland water Transport Department)

PROCEEDING OF THE SUPERINTENDING ENGINEER, NATIONAL HIGHWAYS CIRCLE, BANGALORE.

Sub: Updating of Schedule of Rates of National Highways Circle, Bangalore (based on MORT&H Standard Data book for analysis of the rates and Specification for Road & Bridge Works V Revisions) for the year 2018-19.

- Ref:**
1. Govt Order No.PWD/345/CRM 2000 Dt:02-02-2001.
 2. This office order No.SE/ NHC/ BNG/ AE-3/ SR/ 2545/ 2015-16/ Dtd: 10-12-2015.
 3. National Highways, Circle office Memorandum letter. No.SE/NHCB/AE3/SR/2016-17/ 01/ Dtd: 01-04-2016.
 4. National Highways, Circle office Memorandum letter No.SE/NHCB/AE3/SR/2017-18/1043/Dtd: 01-04-2017.
 5. National Highways, Circle office Memorandum letter No.SE/NHCB/AE3/SR/2018-19/ 01/ Dtd: 02-04-2018.
 6. National Highways, Circle office schedule of rates Meeting Dtd:08-02-2018.
 7. Chief Engineer, R&B South, Bangalore, ಇವರ ಕಛೇರಿ ಆದೇಶ ಸಂ./ ಸಂ.ಕ.ದ/ಸಾ.ಕೋ./ಎ.ಇ-4/ ದಿನಗೂಲಿ/ದರ ಪಟ್ಟಿ/2018-19/Dtd: 24-08-2018.
 8. National Highways, Circle office, schedule of rates Meeting Dtd:24-04-2018.
 9. National Highways, Circle office, schedule of rates Meeting Dtd:15-09-2018.

* * * *

The National Highways Circle Bangalore had prepared the Schedule of Rates for the year 2015-16 vide reference (2) and the same was continued to 2016-17 vide reference (3).

As per the Government Order vide reference (1), the preparation of new Schedule of Rates for the year 2018-19 is taken up. However, the SOR for the year 2016-17 was continued for the year 2017-18 vide reference (4)

A subcommittee was formed on 08-02-2018 vide reference (6) under the Chairmanship of Executive, Engineer, National Highway Division, Tumkur, along with the Technical Assistant, of National Highway circle Bangalore as convener / organizing secretary, the Executive, Engineer, National Highway Division, Bangalore, the Executive, Engineer, National Highway Division, Mangalore, the Executive, Engineer, National Highway Division, Chitradurga, the Executive,

Engineer, National Highway Division, Tumkur, Assistant Executive, Engineer, National Highway sub Division, Bangalore, Assistant Executive, Engineer, National Highway Quality control sub Division, Bangalore, and Assistant Engineer-II of National Highway circle Bangalore as members for sub-committee for the preparation of Schedule of Rates for 2018-19.

The instructions were issued, during the groundwork meetings, to all members to collect market rates of the regularly used materials including GST, royalty, transportation to worksite and other local Charges for items viz; jelly, size stone, sand, bricks, steel, cement. However, the rate of Steel and cement are considered as per the price list posted in the website of different Manufactures For bituminous materials the Mangalore refineries rates have been considered.

Meanwhile, the Government of India introduced Goods and Services Tax (GST) all over India with effect from First day of July 2017. It is an Indirect tax levied on the supply of goods and services. However, Petroleum Products, are not taxed under GST, instead it is taxed separately by the individual state Governments. During this period the rates of bituminous materials have increase due to rise of crude oil price in the international market, decrease in cement rate and increase in steel rate have registered. However, other materials like jelly, size stone, sand, bricks and hire charges of machineries that are used for road construction have marginally increased due to hike in labour charges and also due to rise in rate of petroleum products.

Action was taken for preparation of schedule of rates for 2017-18 with all taxes/GST for all compenents. However, by considering the prevailing market condition, it was felt necessary to prepare Schedule of Rates of 2018-19 based on the latest materials, machineries and laborer rates, hence, the preparation of new Schedule of Rates has been commenced.

As per the instructions issued during meetings reference (6), the Executive Engineers, National Highway Division, Bangalore, Mangalore, Chitradurga and Tumkur Divisions, have collected the market rates. The market rates for the items like jelly of different gradations, gavel, bricks, size stones, sand, steel and cement etc., and other consumables including GST, Royalty, transportation to worksite and other local charges of materials from district and taluka head quarters including all labour, sundries were collected. The steel and cement rates are also down loaded from website price list of different manufacturers. Royalty charges will be paid at source by manufactures, as per mines & geological department circulars/ amendments directly or if not, it will be deducted in bills. GST of 12% on the bill amount will be paid to commercial tax department every month filed by the contractors as per departmental procedures.

The present laborer rate for the year 2018-19 issued under Ref. (7) PW, P&IWTD, Bangalore circle is considered. It is found that laborer rates are increased by 80%. Cement rate has decreased by 16.22% while the rates of asphalt and emulsion, issued by the refineries, as on october 2018, have increased by 25.85% and 30.6% respectively. The rate of steel obtained from the manufacturers website, has decreased by around 29.37%. Now, the rate of fuel, in general has increased by around 24%, which is fluctuating every day, when compared to previous year schedule of rates.

The materials rates furnished by the divisions and sub divisions were collected online. Rates of crushed metal sand is also collected from different manufactures. The laborer rates issued by PWD Bangalore circle is also collected. As fuel rates and laborer rates increased it is opined to consider Whole Price Index (WPI) for increase in price of Hire charges of machineries. However as there is competetion for procuring machineries, in order to compit in tenders. The comittee opeined to retain the previous year hire charges of machineries. Few items of work of 4th revision retained

in earlier SOR 2015-16 are deleted in current Schedule of Rates.

During the meeting held on 30-07-2018 in the Government, the Secretary to Government of Karnataka, Public works department, has instructed to consider market rates of materials without GST on all items as applicable.

Considering the ready reckoner of GST obtained in the Commercial Tax Office (CTO) department's web site, and repeated discussions with the authorities of Commercial tax dept, the bare rate of materials were prepared / evaluated.

Government letter Dated 04-09-2018 has instructed to consider 12% of GST as services to work and to incorporate the same in the estimate. by ascertaining GST rates from Commercial Tax Office and accordingly bring out Schedule of Rates for the year 2018-19. Meanwhile, the commercial Tax department through e-mail has communicated the applicable GST rates on 28-09-2018. Accordingly, bare rates of materials have been incorporated in Schedule of Rates for 2018-19.

During the meeting held on 15-09-2018 it was opined by all members of committee to consider statistics as per standard data book for analysis of rates, 2003 edition published by the Ministry of Road Transport and Highways for the preparation of Schedule of Rates 2018-19.

By considering all above factors, the data is prepared for Schedule of Rates 2018-19. All the rates were verified and discussed in detail and decided to refresh the rates and to issue the schedule of rates for the year 2018-19 immediately.

The following factors were considered in the discussion and were decided to refresh the rates and to issue the schedule of rates for the year 2018-19.

- A. The Revised labour wages rates list issued by PW,P&IWTD, the Chief Engineer, R&B south, Bangalore, vide ಕಛೇರಿ ಆದೇಶ ಸಂ./ ಸಂ.ಕ.ದ/ಸಾ.ಕೋ./ಎ.ಇ-4/ ದಿನ ಗೂಲಿ/ ದರ ಪಟ್ಟಿ/2018-19/ Dtd: 24-08-2018.
- B. The present average market rates without GST for materials like jelly, size stone, sand, bricks, gravel etc., as furnished by the Executive Engineer, National Highway Divisions, of this circle. The rates of other materials considered in the Schedule of Rates of 2018-19 is also obtained from Superintending Engineer, PW, P&IWTD, Bangalore Circle, Bangalore.
- C. The present issue rates of Bitumen, Emulsion, CRMB, issued by HINCOL, MRPL, Refineries Mangalore, without GST.
- D. The rates of TMT steel of FE 500 grade, FE 550 grade were down loaded through website from different manufacturers rates without GST.
- E. The Royalty charges as revised by the Mines & Geology Department is obtained and is included in preparation of data rates.
- F. The percentages of GST is adopted as per the commercial tax department letter mailed on 22-09-2018.
- G. A meeting with contractors was also conducted before finalizing the SOR 2018-19. It was reported by the contractors, that as per recent norms 12% towards GST for the bills are paid to Govt. It was requested for the incorporation of 12% of GST on all items of materials, labour, machineries, etc,

-
- H. The secretary GOK has issued instructions during Schedule of Rates meeting on 30-07-2018 for the preparation of SOR 2018-19 without GST.
- I. The GST rates details published in website of Commercial Tax department, were collected, detailed discussions were also made with CTO departmental authorities at help desk of that office.
- J. SOR for 2018-19 is prepared without considering GST. The rates were discussed in detail in the committee, and divisional officers' opinions were also collected for the rates.
- K. The additional items of work, essential are also included in the Schedule of Rates 2018-19.
- L. Schedule of rates meeting will be held once in every three months to review the rates of Asphalt, Emulsion, Cement & Steel rates and to introduce the latest innovative items, with methodologies of works with demonstration by the authorized manufacturer/dealer etc.,

As per the directions of the Secretary, PW, P&IWTD vide meeting Dt:11-09-2007 the committee has decided to adopt the rates of the Schedule of rates of National Highway Circle, Bangalore only for the National Highway Works. To consider the concerned PW, P&IWTD Circle rates for the other works like Central Road Funds, Economic Importance, Inter State Connectivity etc., by considering the current market rates of cement, asphalt, bitumen and steel rates as issued from time to time by the National Highways Circle, Bangalore for the preparation and comparison of estimates and tenders. The specific instruction has been given that the National Highway Schedule of rates is applicable only for National Highways Works.

The MoRTH Fifth Revision of specifications for Road and Bridge works book, published by the Ministry on 03-01-2013 is considered for the available Data items. Review of the Draft Schedule of Rates was held in the chambers of the Superintending Engineer, National Highways Circle, Bangalore on 15-09-2018. The specifications and current revised rates were discussed in length with the Members of the committee, the Schedule of Rates and Specification were finalized and decided to issue orders for adoption of schedule of rates for the year 2018-19 by obtaining approval from the Chief Engineer, National Highways Zone, Bangalore. Accordingly, the Chief Engineer, National Highways Zone, Bangalore has given concurrence and directions to release the schedule of rates for the year 2018-19.

ORDERS

In view of the above, the Schedule of Rates of National Highways Circle, Bangalore for the year 2018-19 is approved with effect from 31-01-2019.

Sd/-

(RAGHAVAN)

Superintending Engineer,
National Highways Circle,
Bangalore.

Copy submitted to the

- 1) Director General (Road Development), Ministry of Road Transport and Highways, Transport Bhavan, No.1, Parliament Street, New Delhi-110 001.
- 2) Principal Secretary, PW,P&IWT.Department & Housing, Government of Karnataka, M.S.Building, Bangalore-1.
- 3) Secretary, Government of Karnataka PW,P&IWT.Department, M.S.Buildings, Bangalore-1.
- 4) Chief Engineer, National Highways, Bangalore-1.
- 5) Chief Engineer PW,P&IWT.Department, Communication & Buildings (South zone) Bangalore
- 6) Chief Engineer, PW,P&IWT.Department, Communication & Buildings (North zone), Dharwad
- 7) Special Officer and Ex-Officio Deputy Secretary, PW,P&IWT.Department, Finance Cell, Finance Department, Vidhana Soudha, Bangalore-1.

Copy with compliments to the

- 8) Regional Officer, Ministry of Road Transport & Highways, K.R.Circle, Bangalore.
- 9) Superintending Engineer, (Mech) No.417, IV Floor, II Stage, Block "B" M.S.Building, Vidhana Veedhi, Bangalore-1.
- 10) Pay and Accounts Officer, Ministry of Road Transport and Highways, Kendriya Sadana, Koramangala, Bangalore.
- 11) Superintending Engineer, National Highways Circle, Dharwad.
- 12) Superintending Engineer, P.P.P.Cell, Office of the Chief Engineer, National Highways, Bangalore.
- 13) Accountant General (Audit-II) Karnataka, Bangalore.
- 14) Superintending Engineer, PW,P&IWT.D Circle, Bangalore/ Mysore/ Shimoga/ Mangalore/ Hassan/ Bellary.
- 15) Copy forwarded to the Executive Engineer, National Highway Division, Bangalore / Chitradurga / Mangalore / Tumkur & Hassan.
- 16) Copy to Assistant Executive Engineer, National Highway Sub-Division, Bangalore/Mysore/ Malavalli/ Chickka Ballapura/ Tumkur/ Bellur Cross /Mangalore/Sringeri/Kodagu/Hassan/ Holenarispura/Belur/Arasikere/Chitradurga/Shimoga/Hospet/N.H.Special Sub-Division, Shimoga/ Quality Control Sub-Division, National Highways, Bangalore and Chitradurga.
- 17) Copy to Superintending Engineer Table/Technical Assistant, Technical staff's National Highway Circle, Bangalore.
- 18) Extras.

Sd/-
(RAGHAVAN)
Superintending Engineer,
National Highways Circle, Bangalore.

GENERAL NOTES

This Schedule Of Rates is Applicable For National Highway Works Only

- 1 This schedule of rates for the year 2018-19 is applicable for all the works carried out in National Highway Circle Bangalore, for the works costing upto Rs.50.00 Crores. Further for estimates costing more than Rs. 50 Crores, 2% (two percent) is to be deducted on basic rates of works.
- 2 For the items which do not find place, in this Schedule of Rates, the CSR of PW & IWTDC Circle applicable to the area of work shall be adopted. Further for items which do not find place either in this Schedule of Rates or in the Schedule of Rates of PW & IWTDC Circle, applicable to the area of work, data rate shall be got approved from the Superintending Engineer, National Highways Circle, Bangalore before it is incorporated in the estimate.
- 3 Royalty charges shall be recovered as applicable as per orders of Mines and Geology Department circular Dtd: 13-03-2014 and latest government guidelines and circulars and also collection of cess @1% of cost construction to building and other construction works welfare cess act 1996 have to be recovered as per Government Order issued from time to time.
- 4 The MoRT&H, 5th Revision of standard specifications for Road and Bridge works and Code of Practice issued by the IRC & MoRT&H, New Delhi from time to time shall be followed.
- 5 The rates noted in this Schedule of rates 2018-19 are inclusive of Royalty, payable to Government or other agencies as per rules. And the rates of materials, hire charges of machineries are exclusive of GST.
- 6 The cost of materials, exclusive of GST, for the following items adopted in this Schedule of Rates are as follows.

I	VG-40 Bitumen (30/40 Grade) Bulk	Rs. 32,889.83/MT
II	VG-30 Bitumen (60/70 Grade) Bulk	Rs. 31,339.83/MT
III	VG-10 Bitumen (80/100 Grade) Bulk	Rs. 30,539.83/MT
IV	Rapid setting Emulsion of packed (R/C drums) RS1	Rs. 36,793.22/MT
V	Slow setting Emulsion of packed (R/C drums) SS1	Rs. 61,419.49/MT
VI	Crumb Rubber Modified Bitumen-55 Grade Bulk	Rs. 33,065.25/MT
VII	Cement	Rs. 4,921.88/MT
VIII	Mild Steel	Rs. 33,898.31/MT
IX	TMT Steel (Thermo Mechanically Treated) FE500	Rs. 45,169.49/MT
X	TMT Steel (Thermo Mechanically Treated) FE550	Rs. 45,593.22/MT

The rates for Bitumen/Emulsion may be worked out at the time of preparation of estimates by taking the Ex-factory price (exclusive of GST including of all other charges) from the nearest refinery any adding the lead charges from the refinery to the work spot by shortest route. and the difference in rate may be added to /subtracted from the basic rates in the Schedule of Rates as the case may be.

The contractor shall maintain barricades, lights, flagmen, as necessary at either end of the construction area and at such intermediate points as directed by the Engineer.

All arrangements for the traffic during construction including maintenance thereof, construction of temporary diversions, have been considered as incidental charges in this schedule of rates and the same are the responsibility of the contractor. The construction of temporary diversion including temporary cross-drainage structures as described in clause 112.3 of MoRTH Fifth revision specifications for Road and Bridge Works shall be measured in linear meter and the unit contract rate shall be inclusive of full compensation for construction, (including supply of material, labour, tools etc.,) maintenance final dismantling and disposal.

- 11 Any accident involving labour, Construction machinery, any person(s) passing vehicles and their occupants etc., at the work site due to actions or inactions of the contractor, his men and/or machinery will be the responsibility of the Contractor.
- 12 Government of India's Plant & Machinery shall be used for road works wherever available. In case of its non-availability, the same belonging to the State Government may be used. In case of non-availability with Department, the contractor may be permitted by the Executive Engineer to use their own machinery conforming to Ministry's specifications. All machineries to be inspected by the Executive Engineer, and to be reported to SE/CE for its working condition, before the commencement of any work.
- 13 The hire charges of plant, equipment and machinery shown in this Schedule of rates include (I) Fixed components such as depreciation, repairs element and overhead components & (II) Variable component i.e. Running charges (cost of fuel, lubricants, daily, weekly/fortnightly servicing, pay of driver, cleaner, night chowkidar, POL and Labour for service etc., and Overhead components
- 14 The bridge projects may be categorized in two basic types depending upon the width of carriageway and length of bridge. i) Category-I: Major Bridges & ii) Category-II- Minor Bridges.
- 15 The nomenclature is brief and linked with relevant provision of MoRTH specifications with the objective that the same must be read with the specifications for the purpose of interpretation during various stages of execution of the project.
- 16 For various types of Superstructures and conventional types of substructure and foundation in bridge works, the component of formwork has been adopted in percentage form. For specialized bridge works like slip-form shuttering, shuttering for cantilever construction, precise construction, incremental launching, truss type of centering/staging etc., separate data rates shall be prepared as per site conditions and got approved from the Superintending Engineer, National Highways Circle, Bangalore.
- 17 The rates include normal method of curing, for steam curing in case of bridge works with necessary equipment, separate data shall be prepared as per site condition and got approved from the Superintending Engineer, National Highways Circle, Bangalore.
- 18 The rates pertaining to bridge include the element of testing of samples of various materials, brought for use on the work as well as other tests for various items of work. In view of the above and the provision of the additional input for controlled concrete, further provision for quality control is not necessary for estimate purpose.

- 19 The rates in case of bridge works include provisions of necessary devices and other arrangements etc., for traffic control but do not include construction and maintenance of temporary diversion. Provisions of service road/access to various locations in the area of the site has been accounted for in the overheads and need not be added separately for estimate purpose.
- 20 Rates for excavation in case of bridge works also include preparation of rock foundations.
- 21 In the items for well foundation in bridge works, nominal provisions for islanding/temporary protection have been made. For elaborate type of islands with well planned protective measures, coffer dams, etc., special analysis shall be prepared and got approved from the Superintending Engineer, National Highways Circle, Bangalore.
- 22 For innovative types of bridge stuctuctures like cable stayed bridges, suspension bridges, arch bridges, bow string girder bridges, erected by innovative techniques where erecting stage is as important as the construction of bridge components, in terms of input of machinery, manpower and materials, special data rate, shall be prepared and got approved from the Superintending Engineer, National Highways Circle, Bangalore.
- 23 For bridge items pertaining to pre-stressing for convenience, data for one particular system has been adopted. This schedule of rates however holds good for all the systems prevalent in the country with modifications in inputs corresponding to the systems, wherever necessary.
- 24 The bridge items incorporated in the schedule of rates do not cover all the components of bridge projects for all situations. There may be specialize items for specific cases the rates of which shall be prepared separately and got approved from the Superintending Engineer.
- 25 For common items the rates approved in Part-A (Road works) may be followed to the extent applicable for bridge works also.
- 26 Any discrepancies noticed shall be brought to the notice of Superintending Engineer for issue of necessary clarifications.
- 27 This schedule of rates has been prepared based on the MORT&H "Standard data Book for analysis of rates published by the IRC. This standard book is for departmental use only and is a confidential document. It cannot be produced in Court of Law as reference/authority and thus is a privilege document
- 28 For ensuring the quality aspect of the materials used by the contractors such as aggregates, cement, steel and bitumen etc., It is necessary that the contractor shall furnish the quality control test certificates for these materials. The department will have the right to get these materials tested at the cost of the contractor
- 29 Reinforcement shall be measured in length separately for different dia meter as actually used in the work excluding overlaps, length shall include hooks and wastages, overlaps coupling, welded joints, spacer bars annealed steel wire used for binding shall not be measured as the cost of those items is deemed to have been included in the rates of reinforcement.
- 30 Lead for the bitumen is not considered for preparation of schedule of rates. Lead shall be taken from refinery to work spot.
- 31 Lead for steel and cement shall be taken from nearest taluk head quarters to work spot
- 32 Bridge bearing, being commercial items produced by specialized firms with imported technology parts the rates for the same are required to be ascertained from the market for the approved design and technical specifications and to be got approved by the Superintending Engineer.

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- 33 Natural River sand clean, sieved and of good quality or double washed crushed stone sand to be used.
- 34 Use of filtered sand is totally banned in all items of Civil works.
- 35 The rates indicated for "Earth work embankment, subgrade, treated soil, GSB, WMM, Asphalt items, filling potholes, DLC, PQC, PCC, RCC & back filling etc... are for compacted thickness.
- 36 The rates of materials indicated in schedule of rates are only for deriving finished rates of items and for working out data rates and shall not be adopted for making direct payments.
- 37 Ready Mix Concrete: While using RMC, taking out the samples at work site is mandatory for conducting necessary tests. It is the responsibility of the contractor to assure and ensure quality of RMC at the work spot as per design mix for which Executive Engineer shall obtain necessary test certificates as per the IS Standards. RMC supplier. Adherence of IS 4926-20013 and QMS requirements as per IS 9001:2015 covering the technical requirements of IS 4926-2003 shall be assured by RMC Supplier.
- 38 TMT Steel: for Major works such as RCC, vehicular under pass, Pedestrian Under Pass, Aqueduct, Bridges, retaining walls etc,. The contractor shall purchase the TMT Steel manufactured by the Primary plant (TMT Steel from Iron ore) such as SAIL, TATA Steel, ESSAR steel, Shyam Steel, RINL (Vizag) or similar integrated steel plants as per Ministry of Steel Definition.
- 39 For lapping steel reinforcement, preferably 25mm and above, only welding splices shall be done.
- 40 In case of CC pavement, load transfer dowel bars used at the Joints, construction Joints (also at contraction Joint, if used) should be rounded steel bars as one side of the dowel bars are to be de-bonded to allow expansion / contraction of the CC slabs.
- 41 In case of procurement of aggregates and other materials for the works, if royalty charges are already paid by the suppliers, certificates may be obtained in support of deduction and no further royalty shall be recovered from the bills.
- 42 The schedule of rates 2018-19 is prepared excluding of GST with all other charges. The applicable GST as per commercial tax department norms will be added in estimate and the same will be paid in the bills.
- For all materials issued to the contractor at site appropriate GST to be included along with mentioned amount.
- 43 THIS SCHEDULE OF RATES IS APPLICABLE FOR WORKS ON NATIONAL HIGHWAYS ONLY

Sd/-

(RAGHAVAN)
Superintending Engineer,
National Highways Circle,
Bangalore.

CONVERSION TABLE

British Unit to (F.P.S.)	Metric Unit (C.G.S.)	Metric Unit (to C.G.S.)	British Unit (F.P.S.)
I. LENGTH			
1 Inch	2.54 Cm	1 Cm	0.3937 Inch
1 Foot	0.3048 Metre	1 Metre	3.281 Feet
1 Mile	1.609 K.m.	1 K.m.	0.621 Mile
1 Furlong	0.201 K.m.	1 K.m.	4.971 Furlong
II. AREA			
1 Sq. Inch	6.4516 Sq.Cm.	1 Sq.Cm.	0.155 Sq.Inch
1 Sq.ft.	0.0929 Sq.m.	1 Sqm.	10.764 Sq.ft.
100 Sq.ft.	9.29 Sq.m.	1 Hectare	2.471 Acres
1 Acre	4046.90 Sq.m.	1 Sqm.	0.00025 Acre
III. VOLUME			
1 Cu. Inch	16.387 Cu.Cm.	1 Cu.Cm.	0.061 Cu.Inch
1 Cu.ft.	0.0283 Cu.m.	1 Cu.m	35.315 Cu.ft.
1 Gallon (Imp)	4.54596 Ltrs.	1 Ltr.	0.219976 Imp.Gal.
IV. TEMPERATURE			
C ^o	(F ^o - 32) 5 - 9	F ^o	(C ^o + 9)/5 + 32
V. MASS			
1 Tola	11.664 Gram	1 Gram	0.0857 Tola
1 Lb.	0.454 Kg.	1 Kg.	2.205 Lbs.
1 Cwt.	0.508 Quintal	1 Quintal	1.968 Cwt.
1 Ton	1.106 Tonnes	1 Tonne	0.984 Ton
1 Mound (B)	37.323 Kg.	1 Tonne	26.792 Maunds (B)

1 Hectare = 10,000. Sq.m.

**HIRE CHARGES OF PLANT AND MACHINERY CONSIDERED
FOR THE PREPARATION OF S.R. FOR THE YEAR 2018-2019
EXCLUDING GST**

Sl. No.	Description of		Output of Machine		Usage Rates in Rs.	
	Machine	Activity	Unit	Output	Unit	Rate
1.	Dozer D-50-A 15	Spreading	cum / hour	200	Per Hour	1483.05
		Cutting	cum / hour	100		
		Clearing	cum / hour	150		
2.	Dozer D-80-A 12	Spreading	cum / hour	300	Per Hour	2500.00
		Cutting	cum / hour	150		
		Clearing	cum / hour	250		
3.	Motor Grader 3.35	Clearing	cum / hour	200	Per Hour	1762.71
		Spreading	cum / hour	200		
		GSB	cum / hour	50		
		WMM	cum / hour	50		
4.	Hydraulic Excavator of 1 cum bucket	Soil Ordinary	cum / hour	60	per hour	957.63
		Soil Marshy	cum / hour	60		
		Soil Unsuitable	cum / hour	60		
5.	Front end loader 1 cum bucket capacity	Soil loading	cum / hour	60	per hour	593.22
		Aggregate loading	cum / hour	25		
6.	Tipper-5 cum	Transportation of soil, GSB, WMM Hotmix etc	Capacity in cum	5.5	per km	17.71
					per tonne-km	1.95
					per hour	227.97
7.	Vibratory Roller 8 tonne	Earth/Soil	cum / hour	100	per hour	1224.58
		GSB	cum / hour	60		
		WMM	cum / hour	60		
8.	Smooth Wheeled Roller 8 tonne	Soil Compaction	cum / hour	70	per hour	366.95
		BM Compaction	cum / hour	25		
9.	Water Tanker	Water Transport	capacity in KL	6	per hour	39.92
					per km	17.75
10.	Tractor	Pulling	Capacity in HP	50	per hour	266.10
11.	Rotavator	Scarifying	cum/hour	25	per hour	12.33
12.	Ripper	Scarifying	cum / hour	60	per hour	20.79
13.	Air compressor	General Purpose	capacity in cfm	170/250	per hour	244.07

Sl. No.	Description of		Output of Machine		Usage Rates in Rs.	
	Machine	Activity	Unit	Output	Unit	Rate
14.	Wet Mix Plant 60 TPH	Wet Mix	cum / hour	25	per hour	960.17
15.	Mechanical Broom Hydraulic	Surface Cleaning	sqm / hour	1250	per hour	261.86
16.	Bitumen Pressure Distributor	Applying bitumen tack coat	sqm / hour	1750	per hour	754.24
17.	Emulsion Pressure Distributor	Applying emulsion tack coat	sqm / hour	1750	per hour	563.56
18.	Hotmix Plant - 120 TPH capacity	DBM / BM / BC / Premix	cum / hour	40	per hour	15762.54.
19.	Hotmix Plant - 100 TPH capacity	DBM / BM / BC / Premix	cum / hour	30	per hour	11652.54
20.	Hotmix Plant-60 to 80 TPH capacity	DBM / BM / BC / Premix	cum / hour	25	per hour	10169.49
21.	Hotmix Plant-40 to 60 TPH capacity	DBM / BM / BC / Premix	cum / hour	17	per hour	8152.54
22.	Paver Finisher Hydrostatic with sensor control 100 TPH	Paving of DBM / BM / BC / Premix	cum / hour	40	per hour	1966.10
23.	Paver Finisher Mechanical 100 TPH	Paving of WMM Paving of DLC	cum / hour	40/ 30	per hour	745.76
24.	Hydraulic Chip Spreader	Surface Dressing	sqm / hour	1500	per hour	1694.92
25.	Tandem Road Roller	Rolling of Asfalt Surface	cum / hour	30	per hour	876.27
26.	Pneumatic Road Roller	Rolling of Asfalt Surface	cum / hour	25	per hour	876.27
27.	Pot-Hole Repair Machine	Repair of potholes	cum / hour	4	per hour	722.03
28.	Bitumen Boiler Oil Fired	Bitumen Spraying	capacity in litre	1500	per hour	133.05
29.	GSB Plant 50 cum	Producing GSB	cum / hour	40	per hour	764.41
30.	Mastic Cooker	Mastic Wearing Coat	capacity in tonne	1	per hour	47.46
31.	Batching and Mixing Plant					
	a) 30 cum capacity	Concrete Mixing	cum / hour	20	per hour	1567.80
	b) 15-20cum capacity	Concrete Mixing	cum / hour	13	per hour	1311.86

Sl. No.	Description of		Output of Machine		Usage Rates in Rs.	
	Machine	Activity	Unit	Output	Unit	Rate
32.	Transit Mixer	Transportation of Concrete Mix to Site	cum / hour	4.5	per hour	627.12
			cum / hour	3	per hour	574.58
			Tonne / km	4.5	per hour	1.65
			Tonne / km	3	per hour	1.48
33.	Concrete Pump of 45 & 30. cum capacity	Pumping of Concrete	cum / hour	33	per hour	164.41
			cum/hour	22		
34.	Cranes					
	a) 80 tonnes	Lifting Purpose			per hour	822.88
	b) 35 tonnes	Lifting Purpose			per hour	548.31
	c) 3 tonnes	Lifting Purpose			per hour	228.81
35.	Concrete Bucket	For Pouring Concrete	Capacity in cum	1	per hour	10.42
36.	Kerb Casting Machine	Kerb Making	Rmtr/hour	80	per hour	237.29
37.	Concrete Mixer					
	a) 0.4/0.28 cum	Concrete Mixing	cum / hour	2.5	per hour	163.47
	b) 1 cum	Concrete Mixing	cum / hour	7.5	per hour	169.49
38.	Piling Rig with Bantonite pump	0.75 m dia to 1.2m dia Boring Attachment	Rmtr / hour	2 to 3	per hour	4021.19
39.	Concrete Paver Finisher with 40 HP Motor	Paving of Concrete Surface	cum / hour	20	per hour	1838.98
40.	Integrated Stone Crusher	Crushing of Spalls	TPH	100	per hour	5296.61
		Crushing of Spalls	TPH	200	per hour	11144.07
41.	Prestressing Jack with Pump & Access	Stressing of Steel Wires/Stands			per hour	86.44
42.	Generator					
	a) 125 KVA	Generation of	KVA	100	per hour	533.90
	b) 63 KVA	Electric Energy	KVA	50	per hour	284.75
43.	Pneumatic Sinking Plant	Pneumatic Sinking of Wells	cum / hour	1.5 to 2.00	per hour	2813.56
44.	Truck 5.5 cum per 10 tonnes	Material Transport	capacity/ cum	4.5	per hrs	213.56
					per km	16.53
					per tonne km	1.78
45.	Road Marking Machine	Road Marking	Sqm / hour	100	per hour	57.03
46.	Mobile Slurry Seal Equipment	Mixing and laying slurry seal	Sqm / hour	2700	per hour	679.66

LEAD CHARGES

Sl. No.	Description of material Sl. No.	as per Data Unit	Density	in Tonne/ Cum Haulage	Charges Tonne-KM for BT Surface Rate	Cum - Km BT Surface Haulage	Haulage Charges Tonne-KM for unsurfaced gravelled road	Rate Cum - Km unsurfaced gravelled road	Haulage Charges Tonne-KM for katcha road	Rate Cum - Km katcha road	Remarks
1	ROADS										
2	Cement	—	M.T.	—	1.90	—	2.25	—	4.60	—	Extra lead
3	Steel	—	M.T.	—	1.90	—	2.25	—	4.60	—	Extra lead
4	Bitumen	—	M.T.	—	1.90	—	2.25	—	4.60	—	Extra lead
5	Gravel Loose / Earth	—	Cum	1.28	1.90	2.43	2.25	2.88	4.60	5.88	Extra lead
6	Gravel Compacted / Earth	—	Cum	1.55	1.90	2.94	2.25	3.48	4.60	7.13	Extra lead
7	GSB material mixed in Wet mix plant	4.1	Cum	2.00	1.90	3.80	2.25	4.50	4.60	9.20	Extra lead for mixed materials (Wet mix plant)
8	WMM material mixed in Wet mix plant	4.12	Cum	2.20	1.90	4.18	2.25	4.95	4.60	10.12	-- do --
9	Crusher run macadam base material mixed in Wet mix plant	4.17	Cum	2.00	1.90	3.80	2.25	4.50	4.60	9.20	-- do --
10	Bituminous macadam	5.6	Cum	2.30	1.90	4.37	2.25	5.17	4.60	10.58	Extra lead for mixed materials (Hot mix plant)
11	BC	5.8	Cum	2.35	1.90	4.46	2.25	5.28	4.60	10.81	-- do --
12	Open - Graded	5.10	Sqm	0.044	1.90	0.08	2.25	0.10	4.60	0.20	-- do --
13	Premix surfacing	5.11	Sqm	0.044	1.90	0.08	2.25	0.10	4.60	0.20	-- do --
14	Premix Surfacing	5.19	Cum	2.20	1.90	4.18	2.25	4.95	4.60	10.16	-- do --
15	Sand asphalt base course	6.1	Cum	2.20	1.90	4.18	2.25	4.95	4.60	10.16	Extra lead for mixed materials (Cement concrete batch mix plant)
16	Dry lean cement concrete sub - base	6.2	Cum	2.30	1.90	4.37	2.25	5.17	4.60	10.58	-- do --
17	Cement concrete pavement	6.3	Cum	2.20	1.90	4.18	2.25	4.95	4.60	10.16	-- do --
18	Rolled cement concrete base	6.5	Cum	2.20	1.90	4.18	2.25	4.95	4.60	10.16	-- do --
19	Lean concrete - Flyash base / sub-base		Cum	2.20	1.90	4.18	2.25	4.95	4.60	10.16	-- do --

AREA WEIGHTAGES

Additional Weightages for the works to be executed under Extra-Ordinary conditions
NATIONAL HIGHWAYS CIRCLE, BANGALORE

Sl. No.	Category	Weightages.
1	Bhruhat Bangalore Mahanagara Palike Limits(BBMP)	6%
2	City Municipal Limits / Corporation Limits	5%
3	B.M.R.D.A Limits	3%
4	Urban Local Body Areas	3%
5	Bangalore Urban District / Mysore City	3%
6	Major Irrigation Command Area	5%
7	Coatal Areas (upto 25.00 Km)	10%
8	Forest Area	5%
9	Ghat Section, Restricted forest area, National Parks	25%
10	Malanad Area	10%
11	Semi-Malnad Area	5%
12	Sugar Factory Area/Cement Factory Area (upto 5 Kms Radius)	4%
13	Mining area (upto 5 KM Radius)	4%
14	Major Industrial area (upto 5 KM Radius)	5%
15	Border areas (upto 5 KM)	3%

- Note: 1) Only one condition is applicable to one particular work.
2) The chainages should be duly Inspected and Certified by the Divisional officer.
3) It is applicable excluding the cost of Cement, Steel, Bitumen & Emulsion.

PART - 'A'

ROAD WORKS

CHAPTER - 1

CARRIAGE OF MATERIALS

Preamble :

1. The provision of tipper has been made in hours where lead is known like disposal of the materials upto 1000 m. In case where lead is variable like carriage of hot mix or concrete mix from plants or earth from borrow areas, provision has been made in terms of tonne-kilometre (t-km), which can be adopted as per actual conditions.
2. The cost of carriage will vary depending upon the riding surface of the road. Provision has been made accordingly, considering surface roads, unsurfaced gravelled roads and katcha tracks.

CHAPTER-1 CARRIAGE OF MATERIALS

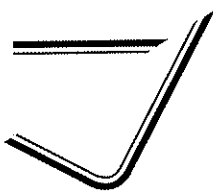
Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
1.01		Loading and Unloading of Stone Boulder/ Stone aggregates/Sand/Kanker/Moorum by mechanical means		
		Placing tipper at loading point, loading with front end loader, unloading by tipping, turning for return trip, excluding time for haulage and return trip including hire charges of all machineries, all labour etc., complete.	Cum	59.60
1.02		Loading manually and Unloading of Boulders by tipping including hire charges of all machineries, all labour etc., complete.	Cum	116.00
1.03		Loading and Unloading of Cement or Steel by Manual Means and Stacking including all labour etc., complete.	M.T.	155.00
1.04		Cost of Haulage of materials by tipper Excluding Loading, Unloading and stacking, including hire charges of all machineries etc., complete.		
	(i)	Surfaced Road.	Ton-Km	1.90
	(ii)	Unsurfaced Graveled Road	Ton-Km	2.25
	(iii)	Katcha Track and Track in River Bed/Nallah Bed and Choe Bed.	Ton-Km	4.60

CHAPTER - 2

SITE CLEARANCE

Preamble :

- 1 Unless otherwise stated, the rates include sorting and disposal of unserviceable material and stacking of serviceable material of the dismantled work neatly in countable / accountable manner at specified place / location with all lifts and upto a lead of 1000 m.
- 2 The rates include T & P and scaffolding required for Items of dismantling
- 3 The dismantling of structures has been catered both by manual and mechanical means. The estimator can use his discretion depending upon quantum of work and particular site conditions.
- 4 For dismantling of structures, which remain submerged in water, the cost may be enhanced by 50 per cent.
- 5 Dismantling of utilities is required to be done under the supervision of concerned departments with prior information to the users.
- 6 The dismantled materials should be examined and a realistic assessment and provision made after due process for the credit for such materials, which can be utilized for works or auctioned.
- 7 In case where lead for disposal is more than 1000 m, extra cost of carriage is required to be added based on tonne-kilometer / Cum-kilometer



CHAPTER-2

SITE CLEARANCE

H ion	Description	Unit	Rate	
			Rs.	Ps.

2.01

Cutting of Trees, including cutting of Trunks, Branches and Removal

Cutting of trees including cutting of trunks, branches and removal of stumps, roots, stacking of serviceable material with all lifts and up to a lead of 1000 metres and earth filling in the depression/pit including all labour, hire charges of all machineries etc., complete.

(i)	Girth from 300 mm to 600 mm	Each	341.00
(ii)	Girth from 600 mm to 900 mm	Each	565.00
(iii)	Girth from 900 mm to 1800 mm	Each	1166.00
(iv)	Girth above 1800 mm	Each	2260.00

- Note**
1. Cutting of trees excluding removal of stump and roots is 35% (assumed).
 2. Removal of Stump and roots including back filling with suitable materials to the required compaction is 65% (assumed).

2.02 201

Clearing Grass and Removal of Rubbish

Clearing grass and removal of rubbish up to a distance of 50 metres outside the periphery of the area.

By Manual Means

Hectare 25900.00

2.03 201

Clearing and Grubbing Road Land .

Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials by (tractor) and stacking of serviceable material to be used or auctioned, up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		including all labour, hire charges of all machineries etc., complete. (for new roads)		
		I By Manual Means:- (disposal by Tractor)		
		A In area of light jungle	Hectare	78100.00
		B In area of thorny jungle	Hectare	104300.00
		II By Mechanical Means		
		A In area of light jungle	Hectare	32600.00
		B In area of thorny jungle	Hectare	39800.00
2.04	202	Dismantling Culverts, Bridges and other Structures/Pavements		
		Dismantling of existing structures like culverts, bridges, retaining walls and other structure comprising of masonry, cement concrete, wood work, steel work, including T&P and scaffolding wherever necessary, sorting the dismantled material, disposal of unserviceable material and stacking the serviceable material at specified location in accountable manner with all lifts and lead of 1000 metres including all labour, hire charges of all machineries etc., complete.		
	(i)	Lime /Cement Concrete		
		I By Manual Means		
		A Lime Concrete, Cement concrete grade M-10 and below	Cum	484.00
		B Cement Concrete Grade M-15 & M-20	Cum	585.00
		C Prestressed / Reinforced cement concrete grade M - 20 & above	Cum	1630.00
		II By Mechanical Means		
		A Cement Concrete Grade M-15 & M-20	Cum	430.00
		B Prestressed / reinforced cement concrete grade M-20 & above	Cum	800.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
(ii)		Dismantling Brick / Tile work Manually		
	A	In lime mortar	Cum	277.00
	B	In cement mortar	Cum	380.00
	C	In mud mortar	Cum	235.00
	D	Dry brick pitching or brick soling	Cum	214.00
(ii a)		Dismantling Brick / Tile work Mechanally		
	A	In lime mortar	Cum	148.00
	B	In cement mortar	Cum	160.00
	C	In mud mortar	Cum	133.00
	D	Dry brick pitching or brick soling	Cum	148.00
(iii)		Dismantling Stone Masonry Manually		
	A	Rubble stone masonry in lime mortar	Cum	315.00
	B	Rubble stone masonry in cement mortar.	Cum	380.00
	C	Rubble Stone Masonry in mud mortar.	Cum	277.00
	D	Dry rubble masonry	Cum	256.00
	E	Dismantling stone pitching/ dry stone spalls.	Cum	235.00
	F	Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials.	Cum	277.00
(iii a)		Dismantling Stone Masonry Mechanally		
	A	Rubble stone masonry in lime mortar	Cum	160.00
	B	Rubble stone masonry in cement mortar.	Cum	175.00
	C	Rubble Stone Masonry in mud mortar.	Cum	160.00
	D	Dry rubble masonry	Cum	160.00
	E	Dismantling stone pitching/ dry stone spalls.	Cum	148.00
	F	Dismantling boulders laid in wire crates including opening of crates and stacking dismantled materials.	Cum	160.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
(iv)		Wood Work wrought framed and fixed in frames of trusses upto a height of 5 m above plinth level	Cum	700.00
(v)		Steel Work in all types of sections upto a height of 5 m above plinth level excluding cutting of rivet.		
	A	Including dismembering	Tonne	1945.00
	B	Excluding dismembering.	Tonne	1460.00
	C	Extra over item No(v) A and(v) B for cutting rivets.	Each	13.85
(vi)		Scrapping of Bricks Dismantled from Brick Work including Stacking.		
	A	In lime/Cement mortar	1000 Nos.	1810.00
	B	In mud mortar	1000 Nos.	648.00
(vii)		Scrapping of Stone from Dismantled Stone Masonry		
	A	In cement and lime mortar	Cum	728.00
	B	In Mud mortar	Cum	154.00
(viii)		Scarping Plaster in Lime or Cement Mortar from Brick/ Stone Masonry	Sqm	21.70
(ix)		Removing all type of Hume Pipes Manually and Stacking in accountable manner at specified location (tractor) within a lead of 1000 metres at specified location (tractor) including earthwork and dismantling of masonry works, without damaging the pipes.		
	A	Up to 600 mm dia	Rmtr	269.00
	B	Above 600 mm to 900 mm dia	Rmtr	364.00
	C	Above 900 mm	Rmtr	623.00

Note 1. The excavation of earth, dismantling of stone masonry work in head walls and protection works is not included which is to be measured and paid separately.

2. Credit for retrieved stone from masonry work may be taken as per actual availability.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
2.05	202	Dismantling of Flexible Pavements		
		Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately including all labour, hire charges of all machineries etc., complete. (dismantal materials to be trasported mechanically)		
	I	By Manual Means		
	A	Bituminous courses	Cum	900.00
	B	Granular courses	Cum	620.00
	II	By Mechanical Means		
	A	Bituminous course	Cum	280.00
2.06	202	Dismantling of Cement Concrete Pavement		
		Dismantling of cement concrete pavement by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials upto a lead of 1000 metres, stacking serviceable and unserviceable materials separately including all labour, hire charges of all machineries etc., complete.	Cum	2730.00
2.07	202	Dismantling of Guard Rails		
		Dismantling guard rails by manual means and disposal of dismantled material with al lifts and up to a lead of 1000 metres, stacking serviceable materials and unserviceable materials separately including all labour, hire charges of all machineries etc., complete.	Rmtr	93.50
2.08	202	Dismantling of Kerb Stone		
		Dismantling kerb stone by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre including all labour, hire charges of all machineries etc., complete.	Rmtr	14.40

Ps.	Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs.	Ps.
	1.09	202	Dismantling of Kerb Stone Channel Dismantling kerb stone channel by manual means and disposal of dismantled material with all lifts and up to a lead of 1000 metre including all labour, hire charges of all machineries etc., complete.	Rmtr	21.60	
	1.10	202	Dismantling of Kilometre Stone Dismantling of kilometre stone including cutting of earth, foundation and disposal of dismantled material with all lifts and lead upto 1000 m and back filling of pit including all labour, hire charges of all machineries etc., complete.			
		A	5th KM stone	Each	490.00	
		B	Ordinary KM Stone	Each	291.00	
		C	200 metre Stone	Each	58.00	
	1.11	202	Dismantling of Fencing Dismantling of barbed wire fencing/ wire mesh fencing including posts, foundation concrete, back filling of pit by manual means including disposal of dismantled material with all lifts and upto a lead of 1000 metres, stacking serviceable material and unserviceable material separately including all labour, hire charges of all machineries etc., complete.	Rmtr	67.00	
	1.12	202	Dismantling of CI Water Pipe Line Dismantling of CI water pipe line 600mm dia including disposal with all lifts and lead upto 1000 metres and stacking of serviceable material and unserviceable material separately under supervision of concerned department including all labour, hire charges of all machineries such as Crane, Truck etc., complete.	Rmtr	137.50	
		Note	The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.			

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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2.13 202 Removal of Cement Concrete Pipe of Sewer Gutter

Removal of cement concrete pipe of sewer gutter 1500 mm dia under the supervision of concerned department including disposal with all lifts and upto a lead of 1000 metres and stacking of serviceable and unserviceable material separately including all labour, hire charges of all machineries such as Crane, Truck etc., complete but excluding earth excavation and dismantling of masonry works.

Rmtr 164.00

Note The rate analysis does not include any excavation in earth or dismantling of masonry works which are to be measured and paid separately.

2.14 202 Removal of Telephone / Electric Poles and Lines

Removal of telephone / Electric poles including excavation and dismantling of foundation concrete and lines under the supervision of concerned department, disposal with all lifts and upto a lead of 1000 metres and stacking the serviceable and unserviceable material separately including all labour, hire charges of all machineries etc., complete.

Each 225.00

CHAPTER - 3

EARTHWORK, EROSION CONTROL AND DRAINAGE

Preamble :

- 1 The rates have been analysed using mechanical means. Manual means for certain items have also been provided which can be used for areas inaccessible to machines and for small jobs.
- 2 In the rate analysis of earthwork, only compacted volume of earth has been considered.
- 3 The rate caters for disposal of unsuitable soil only upto a distance of 1 km. The cost of transportation beyond the initial lead of 1 km shall be paid separately based on tonne-kilometerage/Cum-kilometerage
- 4 The replacement of unsuitable soil by suitable soil shall be included separately in the estimate. The rate analysis for removal of unsuitable soil does not provide for replacement by suitable soil.
- 5 For narrow and restricted areas, plate compactor has been proposed for compaction to achieve the desired density.
- 6 In case excavated rock is found suitable for incorporation in works, suitable credit for the available rock shall be given.
- 7 The possibility of using the blasted rock fragments for backfilling behind structures or backfilling of foundation pits or filling in medians / separators or use in service road shall be examined before proposing disposal of excavated rock.
- 8 In case of hill roads, the cut earth can be pushed down the valley in case there is no objection. In that case, cost of disposal is not required to be provided.
- 9 For inhabited areas, controlled blasting with limited charges of explosives has been provided. This involves smaller drill holes and additional requirement of electric detonators. Provision has accordingly been made.
- 10 Earth excavated from drains can be used in roadway berms. Hence, carriage for disposal of same is not provided.
- 11 Excavation for structures beyond the depth of 3m has been included in Chapter-12
- 12 The items filling behind abutment and wingwall and provision of filter media has been included in Chapter -15
- 13 All servisable hard rock shall be issued to the contractor at site at Rs. 250.00 /Cum.

CHAPTER - 3

EARTH WORK, EROSION CONTROL AND DRAINAGE

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

3.01 301 Excavation in Soil by Manual Means.

Earthwork excavation for roadway in soil by manual means including loading, unloading in truck for carrying of cut earth to **embankment** site with all lifts and **lead upto 1000 metres** including all labour, hire charges of all machineries etc., complete (excavated material to be transported mechanically)

Cum 210.00

Note: In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, the item of carriage in the truck shall be deducted @ Rs.22.60 / Cum .

3.02 301 Excavation in Ordinary Rock by Manual Means.

Earthwork excavation in ordinary rock by manual means including loading, unloading in a truck and carrying of excavated material to **embankment** site with in all lifts and **lead upto 1000 metres** including all labour, hire charges of all machineries etc., complete.

Cum 324.00

Note: In case there is a situation where the cross-section is of cut and fill and cut earth is required to be used in embankment in the immediate vicinity, the item of carriage in the truck shall be deducted @ Rs.22.60/ Cum .

3.03 301 Excavation in Soil

Earthwork excavation for road way in soil by mechanical means using dozer including cutting and **pushing the earth** to site of **embankment** upto a **distance of 100 metres** including trimming bottom and side slopes in accordance

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.
		with requirements of lines, grades and cross sections including all labour, hire charges of all machineries etc., complete. (cutting & filling)	Cum	106.00	
3.04	301	Excavation in Ordinary Rock Earthwork excavation for roadway in ordinary rock by mechanical means using dozer including cutting and pushing the cut earth to site of embankment upto a distance of 100 metres trimming bottom and side slopes in accordance with the requirements of lines, grades and cross sections including all labour, hire charges of all machineries etc., complete.	Cum	182.00	
3.05	301	Excavation in Hard Rock (requiring blasting) Excavation for roadway in hard rock (requiring blasting) by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal of cut rock, stocking all lifts and lead upto 1000 metres including cost of all materials, all labour, hire charges of all machineries etc., complete.	Cum	226.00	
Note: 1. Credit has to be considered as per actuals					
3.06	301	Excavation in Soil Earthwork excavation for roadwork in soil by mechanical means with hydraulic excavator of 0.9 cum bucket capacity including cutting and loading in tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transporting to the embankment location, unloading, with all lifts and lead upto 1000m including all labour, hire charges of all machineries etc., complete.	Cum	34.00	
3.07	301	Excavation in Ordinary Rock Earthwork excavation for roadway in ordinary rock by mechanical means with hydraulic excavator of 0.9 cum bucket capacity including cutting and			

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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loading in tippers, transporting to **embankment** site, unloading, with all lifts and **lead upto 1000 m**, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections including all labour, hire charges of all machineries etc., complete.

Cum 45.90

3.08 301

Excavation for roadway in hard rock (blasting prohibited)

Earthwork excavation for roadway in hard rock (blasting prohibited) including breaking rock, loading in tippers, unloading, **disposal, stocking** with all lifts and **lead upto 1000 metres**, trimming bottom and side slopes in accordance with requirements of lines, grades and cross sections including all labour, hire charges of all machineries etc., complete.

A **Mechanised Method using Hydraulic excavator with rock breakers and loading by mechanical means**

Cum 387.00

B **Manual Method by chiselling and breaking and loading by manual means**

Cum 1426.00

Note: 1. Credit has to be considered as per actuals

3.09 301

Excavation in Hard Rock (controlled blasting)

Earthwork excavation for roadway in hard rock with controlled blasting by drilling, blasting and breaking, trimming of bottom and side slopes in accordance with requirements of lines, grades and cross sections, loading and disposal, of cut road stocking with in all lifts and **lead upto 1000 metres** including cost of all materials, all labour, hire charges of all machineries etc., complete.

Cum 279.00

Note: 1. Credit has to be considered after as per actuals of blasted rock, if found suitable for contrustion

3.10 301

Excavation in Marshy Soil.

Earthwork excavation for roadway in marshy soil with hydraulic excavator 0.9 cum bucket

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling the excavation earth to the extent required and utilising the remaining earth locally for road work including all lead, lifts, labour, spreading etc., complete.		
(i)		Ordinary soil		
	A	Manual Means (Depth upto 3 m)	Cum	414.00
	B	Mechanical Means using Hydraulic excavator (Depth upto 3 m)	Cum	37.00
(ii)		Ordinary Rock (not requiring blasting)		
	A	Manual Means (Depth upto 3 m)	Cum	510.00
	B	Mechanical Means using Hydraulic excavator	Cum	46.50
	Note:	1. In case of rock, foundation beyond 3 m is not dug and hence not included.		
(iii)		Hard Rock (requiring blasting)		
		Manual Means including cost of all materials	Cum	535.00
(iv)		Hard Rock using Air compressor with pneumatic breaker (blasting prohibited)	Cum	554.00
	Note:	1. In case of rock, foundation beyond 3 m is not dug and hence not included.		
(v)		Marshy soil (Filling 0.50 cum of selected earth to foundation with all lead.)		
	A	Manual means (upto 3 m depth)	Cum	695.00
	B	Mechanical Means using Hydraulic excavator (Depth upto 3 m)	Cum	226.00
	Note:	1. Cost of dewatering @ Rs.27.15/Cum may be added, where required for all cases.		
		2. Shoring & strutting @ Rs. 13.55/Cum where required may be added for all cases.		

Ps.	Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
					Rs.	Ps.
			3. It is assumed that Marshy Soil will be available upto 3.00mtr depth only. For deeper excavation below 3.00mtr depth, refer analysis in item (i) to (iv) for ordinary soil etc. for A & B			
			4. If refilling is not done deduct Rs. 90.75 /cum. in marshy soil.			
3.14	305.4.3		Scarifying Existing Granular Surface by Manual Means Scarifying the existing granular road surface such as WBM, WMM to a depth of 50 mm without distributing the base and disposal of scarified material within all lifts and lead upto 1000 metres including all labour, hire charges of all machineries etc., complete.	Sqm	31.00	
			Note: In case material is to be reused at site, transportation cost catered above for disposal shall be deducted @ Rs. 5.35 / Sqm.			
3.15	305.4.3 i)		Scarifying Existing Bituminous Surface by Mechanical Means Scarifying the existing bituminous road surface to a depth of 50 mm and disposal of scarified material with in all lifts nd lead upto 1000 metres including all labour, hire charges of all machineries etc., complete.	Sqm	3.60	
3.16	Addl ii)		Milling Existing Bituminous Surface by Milling Mechine Milling bituminous pavement surface upto a depth of 50 to 75 mm using self loading milling machine, to make a uniform surface without disturbing the base, cleaning the milled surface by mechanical broom, including cost of all labour, lead lift, stacking the milled material within 1000 mtrs radius at specified location. transportation, hire charges of machineries etc complete.,	Sqm	10.30	

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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3.16 305

Construction of Embankment with Material obtained from Borrowpits.

Construction of embankment with approved material obtained from borrow pits in layers not exceeding 250 mm loose thickness, spreading, breaking clods, removal of roots and other organic materials to the required line, grade and cross-section including watering, consolidation by vibratory road roller with desired field density not less than 95% of maximum dry density with all lead and lifts, including loading, unloading, all labour, hire charges of all machineries etc., complete as per table 300-2.

Cum 295.00

Note: Compensation for earth will vary from place to place and will have to be assessed realistically as per particular ground situation. In case earth is available from Govt. land, compensation for earth will not be required hence deduct Rs. 201.70/ Cum. The position is required to be clearly stated in the cost estimate.

3.17 305

Construction of Embankment with Material Deposited from Roadway Cutting

Construction of embankment with approved materials deposited at site from roadway cutting and excavation from drain and foundation of other structures, graded and compacted to meet requirement of table 300-2 in layers not exceeding 250 mm loose thickness, spreading, breaking clods, removal of roots and other organic materials to the required line, grade and cross-section including watering, spreading by Dozer, grading by motor grader and consolidation by vibratory road roller with desired field density not less than 95% of maximum dry density with all lead and lifts, loading, unloading, all labour, hire charges of all machineries etc., complete.

Cum 68.50

Note: In case the earth cutting is done by dozer and pushed for filling in the embankment deduct Rs.15.10 / Cum.

Ps.	Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
					Rs.	Ps.
	3.18	305	Construction of Subgrade and Earthen Shoulders Construction of sub-grade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of table No. 300-2 in layers not exceeding 250mm thick and compacting it by mechanical means after adding water to its OMC, so as to achieve 97% compaction of maximum dry density and finish the surface to the required camber, grade and cross section etc., spreading by Dozer, grading by motor grader, consolidation by vibratory road roller and carriage by tipper complete with all lead and lifts, loading, unloading, all labour, hire charges of machinery etc., complete. (New formation)	Cum	320.00	
	3.19	305.3.4	Compacting Original Ground Compacting original ground supporting sub-grade / embankment Loosening, leveling and Compacting original ground supporting embankment to facilitate placement of first layer of embankment, scarified to a depth of 150 mm, mixed with water at OMC and then compacted by rolling so as to achieve minimum dry density as given in Table 300-2 for embankment construction in layers not exceeding 250 mm loose thickness, spreading, breaking clods, removal of roots and other organic materials to the required line, grade and cross-section including watering, consolidation by vibratory road roller with desired field density not less than 97% of maximum dry density, all labour, hire charges of all machineries etc., complete.	Cum	26.15	
	3.20	305	Stripping and storing Top Soil Stripping, storing of top soil using Dozer by road side at 15 m internal and re-application on embankment slopes, cut slopes and other areas in localities where			

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		the available embankment material is not conducive to plant growth including all lead, lifts, all labour, hire charges of all machineries etc., complete.	Cum	289.00
3.21		Stripping, Storing and Re-laying Top soil from Borrow areas in Agriculture Fields. Stripping of top soil using Dozer from borrow areas located in agriculture fields, storing at a suitable place, spreading and re-laying after taking the borrow earth to maintain fertility of the agricultural field, finishing it to the required levels and satisfaction of the farmer, including all lead, lifts, all labour, hire charges of all machineries etc., complete.	Cum	63.90
3.22	307	Turfing with Sods Furnishing and laying of the live sods of perennial turf forming grass on embankment slope, verges or other locations shown on the drawing or as directed by the engineer including preparation of ground, fetching of sods and watering including all lead, lifts, all labour, hire charges of all machineries etc., complete.	Sqm	26.50
3.23	308	Seeding and Mulching Preparation of seed bed on previously laid top soil, furnishing and placing of seeds, fertilizer, mulching material, applying bituminous emulsion at the rate of 0.23 litres per sqm and laying and fixing jute netting, including watering for 3 months all as per clause 308, including all lead, lifts, all labour, hire charges of all machineries etc., complete.	Sqm	84.00
3.24	309	Surface/ Sub Surface Drains in Soil (New) Construction of unlined surface drains of average cross sectional area 0.40 sqm in soil to specified lines, grades, levels and dimensions to the requirement of clause 301 and 309. Excavated material to be used in embankment within a lead		

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

of 50 metres including all lead, lifts, all labour, hire charges of all machineries etc., complete.

A	Mechanical means using Hydraulic excavator	Rmtr	51.00
B	Manual Means	Rmtr	103.00

3.25 309 Surface Drains in Ordinary Rock

Construction of unlined surface drain of average cross sectional area 0.4 sqm in ordinary rock to specified lines, grades, levels and dimensions as per approved design and to the requirement of clause 301 to 309. Excavated material to be used in embankment at site including all lead, lifts, all labour, hire charges of all machineries etc., complete.

A	Mechanical means using Hydraulic excavator	Rmtr	103.00
B	Manual Means	Rmtr	155.00

3.28 309 Aggregate Sub-Surface Drains

Construction of aggregate sub surface drain 300 mm x 450 mm with aggregates conforming to clause 309 table 300-4, excavated material to be utilised in roadway including all lead, lifts, all labour, hire charges of all machineries etc., complete.

Rmtr 137.00

3.29 309 Underground Drain at Edge of Pavement

Construction of an underground drain 1 m x 1 m (inside dimensions) lined with RCC M-20, 15 cm thick excluding cover slab excavation by hydraulic excavator, concrete by concrete mixer including cost of all labour, material, hire charges of all machineries, excluding cost of steel & fabrication charges etc., complete.

Rmtr 2660.00

Note: Provision to cover slab may be made if required (Crossing etc)

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
3.30	310	Preparation and Surface Treatment of Formation. Preparation and surface treatment of formation by removing mud and slurry, watering to the extent needed to maintain the desired moisture content, trimming to the required line, grade, profile and rolling with 8-10 tonne smooth wheeled roller, to get the required density complete as per clause 310 including all labour, hire charges of all machineries, materials etc., complete.	Sqm	1.70
3.31	313	Rock fill Embankment Construction of rock fill embankment with broken hard rock fragments of size not exceeding 300 mm laid in layers not exceeding 500 mm thick including filling of surface voids with stone spalls, blinding top layer with granular material, using dozer and rolled with vibratory road roller, including all lead, lifts, labour, hire charges of all machineries etc., complete. (excluding cost of stone spalls & granualr material)	Cum	44.95
		Note: It is assumed that rock is available locally at site from roadway cutting incase portion of the rock requires breaking to acceptable size of 300 mm, breaking charges will have to be added		
3.32	301	Excavation in Hill Area in Soil by Mechanical Means Excavation in soil in hilly area by mechanical means using dozer, loading by front end loader including cutting and trimming of side slopes and disposing of excavated earth in tipper with all lifts and lead upto 1000 metres including all labour, hire charges of all machineries etc., complete.	Cum	111.00
		Note: In case the land on the valley side is barren and there is no objection for disposing of excavated earth on the valley side deduct Rs. 29.25/Cum (unservisable)		

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
3.33	301	Excavation in Hilly Area in Ordinary Rock by Mechanical Means not requiring blasting. Excavation in hilly area in ordinary rock not requiring blasting by mechanical means using dozer, loading by front end loader including cutting and trimming of slopes and disposal of cut material in tipper with all lift and lead upto 1000 metres including all labour, hire charges of all machineries etc., complete.	Cum	172.00
		Note: In case the land on the valley side is barren and there is no objection for disposing of excavated earth on the valley side deduct Rs. 40.90/Cum. (unservisable)		
3.34	302	Excavation in Hilly Areas in Hard Rock Requiring Blasting. Excavation in hilly areas in hard rock requiring blasting, by mechanical means using dozer, Air compressor, loading by front end loader including trimming of slopes and disposal of cut material in tipper with all lifts and lead upto 1000 metres including all labour, hire charges of all machineries etc., complete.	Cum	229.00
		Note: In case the land on the valley side is barren and there is no objection for disposing of excavated earth on the valley side deduct Rs. 40.90/Cum. (unservisable)		
3.36	305	Embankment Construction with Flyash / Pond ash available from coal or lignite burning Thermal Plants as waste material. Construction of embankment with Flyash conforming to table 1 of IRC: SP: 58 - 2001 obtained from coal or lignite burning thermal power stations as waste material, spread and compacted in layer of 200mm thickness each at OMC, all as specified in IRC: SP: 58-2001 and as per approved plans including all labour, hire charges of all machineries etc., complete except lead for flyash.	Cum	77.95

CHAPTER - 4

SUB - BASES, BASES (NON-BITUMINOUS) AND SHOULDERS

Preamble :

- 1 Quantities of materials provided are approximate and are meant for the purpose of estimating only. Actual quantities shall be as per mix design.
- 2 For construction of sub-base, Plant mix method is provided.
- 3 In the case of medians, separators and footpaths, plate compactor has been catered for compaction due to restricted space.
- 4 The quantity considered in the output is the compacted quantity.
- 5 The additional item for the improvement is base using in organic compound. (RBI Gr 81 Material)

CHAPTER - 4

SUB-BASES, BASES (NON- BITUMINOUS) AND SHOULDERS

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

4.01 401 Granular Sub-Base with Close Graded Material (Table:- 400-1)

A Plant Mix Method

Construction of Granular sub-base by providing laying, spreading and compacting in layers, mixing in Wet mix plant of 75 tonne capacity at OMC, carriage of mixed material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory roller 8-10 tonne to achieve the desired density of 98% including protection of edges of GSB layer, cost of all materials, labour, hire charges of machinery, lighting, guarding, barricading, maintenance of diversion road, loading & unloading, all lead and lift etc., complete with lead of mixed material upto 1 km. to achieve minimum CBR value of 30% (Compacted Thickness)

(i) Grading-I	Close graded metal	Cum	1700 .00
(ii) Grading-II	Close graded metal	Cum	1620.00
(iii) Grading-III	Coarse graded metal	Cum	1780.00
(iv) Grading-IV	Coarse graded metal	Cum	1730.00
(v) Grading-V	Close graded metal	Cum	1700.00
(v) Grading-V	Close graded metal	Cum	1650.00

Material		Metal	Grit
Requirement:	Coarse GR	1.02 Cum	0.26 Cum
	Close GR	0.89 Cum	0.38 Cum

4.03 402 Lime Stabilisation for Improving Sub-grade

Providing, laying, spreading and compacting of available soil in the sub-grade on a prepared surface, pulverising, mixing the spread soil in place with tractor with ripper and rotavator, 3 per cent slaked lime having minimum content of 70 per cent of CaO, (Calcium oxide) grading with motor grader

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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and compacting with the Vibratory roller 8-10 tonne at OMC to the desired density including protection of edges, cost of all materials, labour, hire charges of machinery, lighting, guarding, barricading, maintenance of diversion road, loading & unloading, all lead and lift etc., complete. (Compacted Thickness)

A	Mixing and laying by Mechanical Means	Cum	375.00
B	Mixing and laying by Manual Means	Cum	437.00

<i>Material</i>	<i>Lime</i>
<i>Requirement:</i>	<i>52.50 Kg</i>

4.04 402**Lime Treated Soil for Sub- Base**

Providing, laying and spreading soil on a prepared sub grade, pulverising with tractor and mixing the spread soil in place with **rotavator**, 3 per cent slaked lime with minimum content of 70 per cent of CaO, (Calcium oxide)grading with **motor grader** and compacting with the vibroatory roller 8-10 tonne at OMC to achieve at least 98 per cent of the maximum dry density to form a layer of sub base, including protection of edges, cost of all materials, labour, hire charges of machinery, lighting, guarding, barricading, maintenance of diversion road, loading & unloading, all lead and lift etc., complete (Compacted Thickness)

Cum 417.00

<i>Material</i>	<i>Lime</i>
<i>Requirement:</i>	<i>52.50 Kg</i>

4.05 403**Cement Treated Soil Sub Base/ Base**

Providing, laying and spreading soil on a prepared sub grade, pulverising with tractor, adding the designed quantity of cement **[4% by weight**

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

of soil] to the spread soil, mixing in place with **rotavator**, grading with the motor grader and compacting with the Vibratory roller at OMC to achieve the desired unconfined compressive strength including protection of edges, cost of all materials, labour, hire charges of machinery, lighting, guarding, barricading, maintenance of diversion road, loading & unloading, all lead and lift etc., complete (Compacted Thickness)

Cum 565.00

<i>Material Requirement:</i>	<i>Cement</i> 70.00 Kg
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4.06 403

Cement Treated Crushed Rock or combination as per clause 403 and table 400-4 in Sub base/ Base

Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement (4% by quantity of crushed rock by weight) to the spread Material, **mixing in place** with tractor, & blade, grading with the **motor grader** and compacting with the Vibratory roller at OMC to achieve the desired unconfined compressive strength including protection of edges, lighting, guarding, barricading, maintenance of diversion road, cost of all materials, labour, hire charges of machinery, loading & unloading, all lead and lift etc., complete. (Compacted Thickness)

(i) For Sub-Base course

Cum 2350.00

(ii) For Base course

Cum 2140.00

<i>Material Requirement:</i>	<i>Metal</i> 1.28 Cum	<i>Cement</i> 80.00 Kg
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4.07 404.3.1

Making 50 mm x 50 mm Furrows

Making 50 mm x 50 mm furrows, 45 degree to the center line of the road and at one metre interval in the

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. P				
		existing thin bituminous wearing coarse including sweeping and disposal of excavated material within 1000 metres, with all lift, hire charges of machinery, labour etc ., complete.						
	(i)	25mm deep furrow cutting	Sqm	5.20				
	(ii)	50mm deep furrow cutting	Sqm	10.45				
4.08	404.3.2	Inverted Choke						
		Construction of inverted choke by providing, laying, spreading and compacting coarse sand of specified grade in uniform layer on a prepared surface with motor grader and compacting with vibratory roller 8-10 tonne etc. including protection of edges, lighting, guarding, barricading, maintenance of diversion road, cost of all materials, labour, hire charges of machinery, loading & unloading, all lead and lift etc., complete. (Compacted Thickness).	Cum	2500.00				
		<table><tr><td>Material</td><td>Coarse sand</td></tr><tr><td>Requirement:</td><td>1.20 Cum</td></tr></table>	Material	Coarse sand	Requirement:	1.20 Cum		
Material	Coarse sand							
Requirement:	1.20 Cum							
4.10	405	Crushed Cement Concrete Sub-base / Base						
		Breaking and crushing of material obtained by breaking damaged cement concrete slabs to size range not exceeding 75 mm as specified in table 400-9 transporting the aggregates obtained from breaking of cement concrete slabs with a lead of 1 km., laying by motor grader and compacting the same as sub base/ base course with Vribraotry roller 8-10 tonne constructed as WBM to clause 404 (except the use of screening or binding Material) including making necessary earthen bunds to protect edges, lighting, guarding, barricading, maintenance of diversion road, cost of all materials, labour, hire charges of machinery, loading & unloading, all lead and lift etc., complete. (Compacted Thickness)	Cum	205.00				

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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Note 1. It is assumed that dismantling of concrete slab/pavement has been considered separately. Hence same is not added in this rate. Only labour for crushing the dismantled slab into aggregate has been added. Carriage from stock pile to work site has been provided with a lead of 1 km.

2. In case of breaking of slabs is done locally without involvement of transportation, the provision of tipper, front end loader and loading/unloading charges may be deleted @ Rs.16.70/cum

4.11 405

Penetration Coat Over Top Layer of Crushed Cement Concrete Base

Providing and laying penetration coat over top layer of crushed concrete base after cleaning by mechanical broom applying bitumen 60/70 Grade @ 25kg/10 Sqmtr by bitumen pressur distributor spreading of key aggregates of 11.2mm size at 0.13 cum/10 Sqmtr by mechanical gritter rolling by Vibratory roller including cost of all materials, labour, hire charges of machinery, lighting, guarding, barricading, maintenance of diversion road, loading, unloading with all lead and lift etc., complete except lead for bitumen.

Sqm 117.00

<i>Material Requirement:</i>	<i>Metal 0.013 Cum</i>	<i>Bitumen Gr:60/70 2.5 Kg</i>
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4.11 406

Wet Mix Macadam

Plant Mix Method

Construction of **Wet Mix Macadam** by providing laying, spreading and compacting of graded stone aggregates as per Table 400-13, mixing in a Wet mix plant of 75 tonne capacity at OMC, carriage of mixed material to work site in tipper to paver,

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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laid over a previously prepared surface to the required grade, level and alignment, compacting with vibratory roller 8-10 tonne to achieve the desired density of 98% including protection of edges of WMM layer, cost of all materials, labour, hire charges of machinery, lighting, guarding, barricading, maintenance of diversion road, loading & unloading, all lead and lift etc., complete with lead of mixed material upto 1 km. (Compacted Thickness)

A	By using mechanical paver finisher	Cum	1795.00
B	By using Motor grader	Cum	1810.00
C	By using Sensor paver finisher	Cum	1830.00

<i>Material Requirement:</i>	<i>Metal</i> 0.92 Cum	<i>Grit</i> 0.40 Cum
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4.13 408

Construction of Median and Island with Soil Taken from Roadway Cutting

Construction of Median and Island above road level with approved material deposited at site from roadway cutting and excavation for drain and foundation of other structures, spread, sloped, graded and compacted by plate compactor, including all labour, hire charges of machinery, loading, unloading with all lead and lift etc., complete.

Cum 175.00

Note:- This analysis provides for median and island with earthen top. In case the surface is required to be turfed or planted with shrubs, the same is required to be provided separately. In case granular fill is required to be paved, quantities of paving are required to be calculated as per approved design and paid separately for Items.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
4.14	408	Construction of Median and Island with Soil Taken from Borrow Areas Construction of median and Island above road level with approved material brought from borrow pits, spread, sloped, graded and compacted by plate compactor, including cost of all materials, labour, hire charges of machinery, loading, unloading with all lead and lift etc., complete with lead of gravel upto 1 km. (Compacted Thickness)	Cum	159.00
		Note:- This analysis provides for median and island with earthen top. In case the surface is required to be turfed or planted with shrubs, the same is required to be provided separately. In case granular fill is required to be paved, quantities of paving are required to be calculated as per approved design and paid separately for Items.		
4.15		Construction of Shoulders A. Earthen Shoulders The rate as applicable for sub-grade construction may be adopted. B. Hard Shoulders Rate as applicable for sub-base and or base may be adopted as per approved design. C. Paved shoulders The rate may be adopted as applicable for different layers of pavement depending upon approved design of paved shoulders.		
4.16	410	Footpaths and Separators Construction of footpath/separator by providing 150 mm compacted granular sub base coarse graded material Grading 1 as per clause 401 and 25 mm thick cement concrete grade M15, over laid with pre-cast concrete tiles of size 300X300mm in C.M. 1:3,		

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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including provision of all drainage arrangements with 200mm dia RCC pipes but excluding kerb channel to proper lines, levels and dimensions as per drawing, including cost of all materials, labour, hire charges of machinery, loading, unloading with all lead and lift etc., complete.

Sqm 800.00

<i>Material Requirement:</i>	<i>Metal</i>	<i>FA</i>	<i>Cement</i>	<i>Tiles</i>
	0.2205 Cum	0.024 Cum	12.36 Kg	11 Nos

4.17 407 B Crusher Run Macadam Base by Plant Mix Method

Construction of Crusher Run Macadam Base by providing laying, spreading and compacting of crushed stone aggregates as per Table 400-14, mixing in a Wet mix plant of 75 tonne capacity at OMC, carriage of mixed material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory roller 8-10 tonne to achieve the desired density of 98% including protection of edges, cost of all materials, labour, hire charges of machinery, lighting, guarding, barricading, maintenance of diversion road, loading & unloading, all lead and lift etc., complete with lead of mixed material upto 1 km. (Compacted Thickness)

(i) For 53 mm maximum size Cum 1760.00

(ii) For 45 mm maximum size Cum 1810.00

<i>Material Requirement:</i>	<i>Metal</i>
	1.32 Cum

4.18 402, 403 Lime, Flyash Stabilised Soil for Sub Grade/ Sub Base

Construction of Sub-base using lime - Flyash admixture with granular soil, free from organic matter/ deleterious material or clayey silts and low

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

plasticity clays having PI between 5 and 20 and liquid limit less than 25 and commercial dry lime, slaked at site or pre-slaked with CaO (Calcium Oxide) content not less than 50 per cent, Flyash to conform to gradation as per clause 4.3 of IRC: 88-1984, lime + Flyash content ranging between 10 to 30 per cent, the minimum un-confined compressive strength and CBR value after 28 days curing and 4 days soaking to be 7.5kg/sq.cm and 25 per cent respectively, all as specified in IRC: 88-1984 using Hydraulic excavator, motor grader, tipper, tractor, vibratory roller 8-10 Tonnes, tractor with disc harrows, cost of all materials, labour, hire charges of machinery, lighting, grading, barricading, maintenance of diversion road, loading & unloading, all lead and lift etc., complete including lead for earth upto 1km, except lead for flyash and slaked lime. (Compacted Thickness)

Cum 553.00

<i>Material</i>	<i>Slaked Lime</i>	<i>Earth</i>
<i>Requirement:</i>	<i>60.41 Kg</i>	<i>0.75 Cum</i>

Note 1. If earth is taken from Government land, Deduct Rs. 152.00/ Cum

2. Lime + Flyash has been taken as 20 per cent of total mass and ratio of lime and Flyash as 1:4 for estimating purposes. Total quantities will be as per approved design.

4.19 Addl.

By Mix in Place Method (GSB using available materials at site)

Construction of **Granular sub-base** by providing, laying, spreading and compacting of **graded material**, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller 8-10 tonne to achieve the desired density of 98% including protection of edges of GSB layer, cost of all labour, hire charges of machinery,

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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lighting, guarding, barricading, maintenance of diversion road, loading & unloading, all lead and lift etc., complete. using available GSB Material to achieve minimum CBR value of 30% (Compacted Thickness)

Cum 110.00

(WMM using available materials at site)

Construction of **Wet Mix Macadam** by providing, laying, spreading and compacting of **graded material**, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method with rotavator at OMC, and compacting with vibratory roller 8-10 tonne to achieve the desired density of 98% including protection of edges of WMM layer, cost of all labour, hire charges of machinery, lighting, guarding, barricading, maintenance of diversion road, loading & unloading, etc., complete. using available WMM Material (Compacted Thickness)

Cum 129.00

4.21 Addl. Stabilisation of sub base by Inorganic compound

- I** Pulverising the local soil in place, spreading with rotavator duly adding the specified quantity of inorganic Compound as approved by CRRI, mixing thoroughly, sprinkling desired quantity of water, grading with motor grader and compacting with the road roller at OMC to the desired density for improving the subgrade & shoulders. (The laboratory CBR of the compacted soil shall not be less than 10) For soils having WL between 35 & 50, with 1% of inorganic Compound (RBI Grade 81) by weight of Soil.

Cum 685.00

- II** Pulverising the local soil in place, spreading with rotavator duly adding the specified quantity of inorganic Compound RBI Grade 81 as approved by CRRI, mixing thoroughly, sprinkling desired

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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quantity of water, grading with motor grader and compacting with the road roller at OMC to the desired density for improving the subgrade & shoulders. (The laboratory CBR of the compacted soil shall not be less than 10) For soils having WL more than 50, with 2% of inorganic Compound like RBI Grade 81 by weight of soil.

Cum 1270.00

CHAPTER - 5

BASES AND SURFACE COURSES (BITUMINOUS)

Preamble :

- I The Clauses of MoSRT&H Specifications, which have been mentioned for each item, may be referred for detailed specifications and construction procedure. The rate analysis mention only brief description.
- 2 The machinery and equipment included in various analysis are as per various specifications of MoSRT&H and are mandatory. As per the present trend, contractors are procuring machinery and equipment of higher capacity. Provision has accordingly been made.
- 3 Outputs taken for the construction equipment are for the compacted quantities of the relevant Items and not for loose quantities.
- 4 Tack coat and prime coat, wherever provided, are required to be measured and paid separately.
- 5 Cleaning of surface is a part of the prime coat and tack coat. As such cleaning of surface has not been provided for bituminous courses as the same is already catered in prime/tackcoat.
- 6 40/60 TPH capacity HMP may be used only for minor works and repair nature of works. (Permission to be obtained from Superintending Engineer, before incorporating item of work) certified in estimate.
- 7 Rolling of bituminous courses is required to be done as per Clause 501.6
- 8 Spreading of bituminous materials shall be done by mechanical means except in areas where a hydrostatic paver with sensor controle or mechanical paver cannot have access.
- 9 The source of all materials to be used on the project must be tested and expressly approved by the Engineer.
- 10 The specification and requirements for modified binder with various type of modifiers have been laid down in Clause 521 of MoSRT&H Specifications and IRC: SP:53-2002 which shall be followed.
- 11 The guidelines given vide Annexure - 'A' to Clause 501 of MoSRT&H Specifications in regard to protection of environment shall be followed for a particular situation.
- 12 Choice of grade of bitumen shall be made as per the guidelines given in Appendix IV of MoSRT&H Specifications.
- 13 As per IS 73-2013 paving Bitumin - Specification (5th Revision) - published by BIS in April 2013 regarding Use of viscosity grade (VG) bitumen in road construction for bitumen (VG-30), bitumen (VG-10) have been adopted.
- 14 Job mix tob obtained before commencement of work with methodology as per clause 505.3.3, 505.3.4 & 505.3.5

CHAPTER - 5

BASES AND SURFACE COURSES (BITUMINOUS)

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.
501	502	A Prime Coat			
		Providing and applying primer coat with slow setting bitumen emulsion (SS1) complying with IS 8887 of approved quality and make on prepared surface of granular Base such as WBM, WMM including cleaning of road surface by Mechanical Broom & dusting by Air compressor, and spraying using Bitumen Pressure Distributor, uniformly at the rate of 0.80 kg/sqm as per Table 500-3, including cost of all materials, labour, hire charges of machinery, loading, unloading etc., complete, except lead for emulsion.	Sqm	60.00	
		B On Stabalise soil / crusher run macadom @ 1 kg / Sqm	Sqm	75.00	
502	503	Tack Coat			
	503	I Providing and applying Tack Coat as per Table 500-5 on prepared surface using VG-10 grade Paving Bitumen complying with IS.73-2013 and as per IRC-22 of approved quality and make including cleaning of road surface by Mechanical Broom & dusting by Air compressor, and spraying by Bitumen Pressure Distributor, including cost of all materials, labour, hire charges of machinery, loading, unloading stacking, etc complete, except lead for bitumen.			
		A On black topped surface at min. 2.0kg/10 sqm	Sqm	8.65	
		B On granular base such as WBM & WMM surfaces treated with primer / over B.T. surface [dry & hungry] at min. 2.5 kg/10 Sqm	Sqm	10.50	
		C On Cement Concrete surface at min. 3.0 Kg/10 Sqm	Sqm	12.35	

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
5.03	504	Bituminous Macadam Providing and laying Bituminous Macadam using crushed aggregates as per table 500-7 of specified grading, premixed with minimum bituminous binder VG-30 grade Paving Bitumen (as per clause 504.2.1) complying with IS.73-2013 by Batch / Hot mix plant, loading of aggregates with F.E. loader, transported to site in tipper to paver, laid over a previously prepared surface with hydrostatic paver finisher with sensor control to the required grade, level, alignment, rolling with Smooth wheeled roller 8-10 tonnes, vibratory roller 8 tonnes, smooth wheeled tandem roller 6-8 tonnes as per clauses 501.6 and 501.7 to achieve the desired compaction, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting etc complete, except lead for Bitumen, with a lead of mixed material upto 1 Km, excluding cost of primer/tack coat. (Compacted thickness)		
	A	<u>Using 100-120 TPH Batch mix plant</u>		
	i)	80 - 100 mm compacted thickness (Grading 1) with 3.3% Bitumen VG-30	Cum	5575.00
	(ii)	50 - 75 mm compacted thickness (Grading 2) with 3.4% Bitumen VG-30	Cum	5620.00
	B	<u>Using 80-100 TPH Batch mix plant</u>		
	i)	80 - 100 mm compacted thickness (Grading 1) with 3.3% Bitumen VG-30	Cum	5570.00
	(ii)	50 - 75 mm compacted thickness (Grading 2) with 3.4% Bitumen VG-30	Cum	5615.00
	C	<u>Using 40-60 TPH Hot mix plant</u>		
	(i)	80 - 100 mm compacted thickness (Grading 1) with 3.3% Bitumen VG-30	Cum	5965.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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|------|---|------------|----------------|
| (ii) | 50 - 75 mm compacted thickness (Grading 2) with 3.4% Bitumen VG-30 | Cum | 6005.00 |
|------|---|------------|----------------|

<i>Material Requirement:</i>	<i>Metal</i> GR-I 1.418 Cum GR-II 1.415 Cum	<i>Bitumen VG-30</i> 72.44 Kg 74.63 Kg
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Note :- 1. If Mechanical Paver finisher is used deduct Rs. 108.00/Cum for 5.02 C. (For small works, narrow stretch)

2. Job mix to be obtained before commencement of work as per clause 505.3.3, 505.3.4 & 505.3.5

4.04 507

Dense Graded Bituminous Macadam

Providing and laying **Dense Graded Bituminous Macadam** using crushed aggregates as per table 500-10 of specified graded aggregates and filler @ 2% by weight of aggregates, premixed with minimum bituminous binder VG-40/VG-30 grade Paving Bitumen (as per clause 504.2.1) complying with IS.73-2013 in Batch / Hot mix plant, loading of aggregates with F.E. loader, transported to site in tipper to paver, laid over a previously prepared surface with **hydrostatic paver finisher with sensor control** to the required grade, level, alignment, rolling with Smooth wheeled roller 8-10 tonnes, vibratory roller 8 tonnes, smooth wheeled tandem roller 6-8 tonnes as per clauses 501.6 and 501.7 to achieve the desired compaction, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting etc complete, except lead for Bitumen, with a lead of mixed material upto 1 Km excluding cost of primer/tack coat. (Compacted thickness)

A

Using 100-120 TPH Batch mix plant

- | | | | |
|-----|--|------------|----------------|
| (i) | 75- 100 mm compacted thickness (Grading 1) with 4.00% Bitumen VG-40 | Cum | 6390.00 |
|-----|--|------------|----------------|

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		(ii) 75 - 100 mm compacted thickness (Grading 1) with 4.00% Bitumen VG-30	Cum	6225.00
		(iii) 50 - 75 mm compacted thickness (Grading 2) with 4.50% Bitumen VG-40	Cum	6900.00
		(iv) 50 - 75 mm compacted thickness (Grading 2) with 4.50% Bitumen VG-30	Cum	6705.00
B		<u>Using 80-100 TPH Batch mix plant</u>		
		(i) 75 - 100 mm compacted thickness (Grading 1) with 4.00% Bitumen VG-40	Cum	6390.00
		(ii) 75 - 100 mm compacted thickness (Grading 1) with 4.00% Bitumen VG-30	Cum	6220.00
		(iii) 50 - 75 mm compacted thickness (Grading 2) with 4.50% Bitumen VG-40	Cum	7110.00
		(iv) 50 - 75 mm compacted thickness (Grading 2) with 4.50% Bitumen VG-30	Cum	6920.00
C		<u>Using 40-60 TPH Hot mix plant</u>		
		(i) 75 - 100 mm compacted thickness (Grading 1) with 4.00% Bitumen VG-30	Cum	6610.00
		(ii) 50 - 75 mm compacted thickness (Grading 2) with 4.50% Bitumen VG-30	Cum	7090.00

Material Requirement:	Metal	Bitumen VG-30	Filler
GR-I	1.44 Cum	92.30 Kg	44.30 Kg
GR-II	1.44 Cum	103.84 Kg	44.07 Kg

Note :- 1. If Mechanical Paver finisher is used deduct Rs.119.00 Cum for 5.04 C.

2. Job mix to be obtained before commencement of work as per clause 505.3.3, 505.3.4 & 505.3.5

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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5.05 507

Bituminous Concrete

Providing and laying **Bituminous Concrete** using crushed stone aggregates as per table 500-17 of specified graded aggregates and filler @ 2% by weight of aggregates premixed with minimum bituminous binder VG-30 grade Paving Bitumen (as per clause 504.2.1) complying with IS 73-2013 /IS 15462(IRS SP53) in Batch / Hot mix plant, loading of aggregates with F.E. loader, transported to site in tipper to paver, laid over a previously prepared surface with **hydrostatic paver finisher with sensor control** to the required grade, level, alignment, rolling with Smooth wheeled roller 8-10 tonnes, vibratory roller 8 tonnes, smooth wheeled tandem roller 6-8 tonnes as per clauses 501.6 and 501.7 to achieve the desired compaction, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting etc complete, except lead for Bitumen with a lead of mixed material upto 1 Km excluding cost of primer/tack coat. (Compacted thickness)

A**Using 100-120 TPH Batch mix plant**

- (i) **Grading 1** with 5.2% Bitumen (50 mm compacted thickness)

(a) Using VG-40 grade Bitumen	Cum	7700.00
(b) Using VG-30 grade Bitumen	Cum	7470.00
(c) Using CRMB - 55 Grade IRC SP 53 & IS 15462	Cum	7720.00

- (ii) **Grading 2** with 5.4% Bitumen (30 - 40 mm compacted thickness)

(a) Using VG-40 grade Bitumen	Cum	7810.00
(b) Using VG-30 grade Bitumen	Cum	7575.00
(c) Using CRMB - 55 Grade RC SP 53 & IS 15462	Cum	7840.00

B**Using 80-100 TPH Batch mix plant**

- (i) **Grading 1** with 5.2% Bitumen (50 mm compacted thickness)

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		(a) Using VG-40 grade Bitumen	Cum	7690.00
		(b) Using VG-30 grade Bitumen	Cum	7460.00
		(c) Using CRMB - 55 Grade	Cum	7715.00
		(ii) Grading 2 with 5.4% Bitumen (30 - 40 mm compacted thickness)		
		(a) Using VG-40 grade Bitumen	Cum	7805.00
		(b) Using VG-30 grade Bitumen	Cum	7565.00
		(c) Using CRMB - 55 Grade	Cum	7835.00
C		<u>Using 40-60 TPH Hot mix plant</u>		
		(i) Grading 1 with 5.2% Bitumen (50 mm compacted thickness)		
		(a) Using VG-30 grade Bitumen	Cum	7870.00
		(b) Using CRMB - 55 Grade	Cum	8320.00
		(ii) Grading 2 with 5.4% Bitumen (30 - 40 mm compacted thickness)		
		(a) Using VG-30 grade Bitumen	Cum	7980.00
		(b) Using CRMB - 55 Grade	Cum	8440.00

<i>Material</i>	<i>Metal</i>	<i>CRMB/VG30</i>	<i>Filler</i>
<i>Requirement:</i>	<i>GR-I 1.459 Cum</i>	<i>122.51 Kg</i>	<i>44.67Kg</i>
	<i>GR-II 1.456 Cum</i>	<i>127.23 Kg</i>	<i>44.576 Kg</i>

Note :- 1. If Mechanical Paver finisher is used deduct Rs. 160.00/Cum for 5.05 C.

2. Job mix to be obtained before commencement of work as per clause 505.3.3, 505.3.4 & 505.3.5

5.05 507

Bituminous Concrete Using plastorneric thermo plastic (waste plastic)

Providing and laying **Bituminous Concrete** using plastorneric thermo plastic (waste plastic additive at 8% of bitumen) crushed stone aggregates as per

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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table 500-17 of specified graded aggregates and filler @ 2% by weight of aggregates premixed with minimum bituminous binder VG-30 grade Paving Bitumen (as per clause 504.2.1) complying with IS 73-2013 /IS 15462(IRC SP53) with plastorneric thermoplastic in Batch / Hot mix plant, loading of aggregates with F.E. loader, transported to site in tipper to paver, laid over a previously prepared surface with **hydrostatic paver finisher with sensor control** to the required grade, level, alignment, rolling with Smooth wheeled roller 8-10 tonnes, vibratory roller 8 tonnes, smooth wheeled tandem roller 6-8 tonnes as per clauses 501.6 and 501.7 to achieve the desired compaction, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting etc complete, except lead for Bitumen with a lead of mixed material upto 1 Km excluding cost of primer/tack coat. (Compacted thickness)

A**Using 100-120 TPH Batch mix plant**

- | | | | |
|------|---|------------|----------------|
| (i) | Grading I with 4.78% Bitumen and 0.42 % plastorneric thermoplastic (50 mm compacted thickness) | | |
| (a) | Using VG-40 grade Bitumen | Cum | 7630.00 |
| (b) | Using VG-30 grade Bitumen | Cum | 7419.00 |
| (ii) | Grading II with 4.97% Bitumen and 0.43 % plastorneric thermoplastic (30-40 mm compacted thickness) | | |
| (a) | Using VG-40 grade Bitumen | Cum | 7740.00 |
| (b) | Using VG-30 grade Bitumen | Cum | 7520.00 |

B**Using 80-100 TPH Batch mix plant**

- | | | | |
|-----|---|------------|----------------|
| (i) | Grading I with 4.78% Bitumen and 0.42 % plastorneric thermoplastic (50 mm compacted thickness) | | |
| (a) | Using VG-40 grade Bitumen | Cum | 7620.00 |

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.															
		(b) Using VG-30 grade Bitumen	Cum	7412.00															
		(ii) Grading II with 4.97% Bitumen and 0.43 % plastorneric thermoplastic (30-40 mm compacted thickness)																	
		(a) Using VG-40 grade Bitumen	Cum	7720.00															
		(b) Using VG-30 grade Bitumen	Cum	7500.00															
<table border="1"> <tr> <td><i>Material</i></td><td><i>Metal</i></td><td><i>VG 40/VG 30</i></td><td><i>Plastic</i></td><td><i>Filler</i></td></tr> <tr> <td><i>Requirement:</i></td><td>GR-I 1.459 Cum</td><td>122.72 Kg</td><td>9.80kg</td><td>44.67Kg</td></tr> <tr> <td></td><td>GR-II 1.456 Cum</td><td>117.07 Kg</td><td>10.18kg</td><td>44.576 Kg</td></tr> </table>					<i>Material</i>	<i>Metal</i>	<i>VG 40/VG 30</i>	<i>Plastic</i>	<i>Filler</i>	<i>Requirement:</i>	GR-I 1.459 Cum	122.72 Kg	9.80kg	44.67Kg		GR-II 1.456 Cum	117.07 Kg	10.18kg	44.576 Kg
<i>Material</i>	<i>Metal</i>	<i>VG 40/VG 30</i>	<i>Plastic</i>	<i>Filler</i>															
<i>Requirement:</i>	GR-I 1.459 Cum	122.72 Kg	9.80kg	44.67Kg															
	GR-II 1.456 Cum	117.07 Kg	10.18kg	44.576 Kg															

5.06 515

Stone Matrix Asphalt (SMA)

Providing and laying **Stone Matrix Asphalt (SMA)** using crushed stone aggregates as per table 500-37 of specified graded aggregates and filler (Hydrated Lime Dust) @ 3% of weight of aggregates and Cellulos fiber at 0.3% of weight of mix premixed with minimum VG 30 grade bituminous binder complying with IS.73-2013 in Batch / Hot mix plant, loading of aggregates with F.E. loader, transported to site in tipper to paver, laid over a previously prepared surface with **hydrostatic paver finisher with sensor control** to the required grade, level, alignment, rolling with Smooth wheeled roller 8-10 tonnes, vibratory roller 8 tonnes, smooth wheeled tandem roller 6-8 tonnes as per clauses 501.6 and 501.7 to achieve the desired compaction, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting etc complete, except lead for Bitumen with a lead of mixed material upto 1 Km excluding cost of primer/ tack coat. (Compacted thickness)

A**Using 100-120 TPH Batch type Hot mix plant**

- (i) 19 mm SMA with 5.8% Bitumen (45-75 mm compacted thickness) VG-30 Cum 8557.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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- | | | | |
|-------|--|-----|---------|
| (ii) | 13 mm SMA with 5.8% Bitumen (45-75 mm compacted thickness) VG-30 | Cum | 8565.00 |
| (iii) | 19 mm SMA with 5.8% Bitumen (40-50 mm compacted thickness) VG-40 | Cum | 8814.00 |
| (iv) | 13 mm SMA with 5.8% Bitumen (40-50 mm compacted thickness) VG-40 | Cum | 8821.00 |

Material	Metal	Bitumen VG: 30/60-70	Filler (Hydred Lime Dust)
Requirement :	19mm 1.339 Cum	136.65 Kg	66.58 Kg
	13 mm 1.435 Cum	136.65 Kg	66.58 Kg

Note : Pnumatic Tyre Roller should not be used

407 507

Milled Material Asphalt Pavement

Providing and laying **Recycled Milled Asphalt Pavement** after cold milling stacked at plant site, by caryingout necessary check / tests on milled mix, and evaluating by asdding fresh materials as required including rejunevaration as requiired (upto 1% of bituminous binder & 10% of graded agrigate as per required gradation) premixed with 80/100 TPH HMP as per clause 500 of MORT&H, transported to site in tipper to paver, laid over a previously prepared surface with **hydrostatic paver finisher with sensor control** to the required grade, level, alignment, rolling with Smooth wheeled roller 8-10 tonnes, vibratory roller 8 tonnes, smooth wheeled tandem roller 6-8 tonnes as per clauses 501.6 and 501.7 to achieve the desired compaction, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting etc complete, except lead for Bitumen , with a lead of mixed material upto 1 Km excluding cost of primer/tack coat. (Compacted thickness)

Grading-I /Grading-II	Cum	2120.00
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Note: Milled material may be added with fresh mix up to 20% (for DBM/BM works)

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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5.09 509

Surface Dressing

Providing and laying **surface dressing** as wearing course consisting of layer of bitumen binder VG-30 grade Paving Bitumen complying with IS -73 2013 laid on the prepared surface followed by a cover of crushed stone chippings of specified size as per table No. 500-20 & 21 (may be precoated also) in single coat, cleaning with mechanical broom and dusting with Air compressor, applied using bituminous pressure distributor, spreading by hydraulic self propelled chip spreader, rolling with 8-10 tonne smooth wheeled roller, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting, etc complete, except lead for Bitumen.

Case -1 :- Using 19 mm nominal size chipping at 0.15 cum/10 Sqm & Binder @ 12 Kg/10 Sqm

Sqm 72.00

Case -2 :- Using 13 mm nominal size chipping at 0.10 cum /10 Sqm & Binder @ 10 Kg/10 Sqm

Sqm 57.00

5.10 510

Open - Graded Premix Surfacing

Case I

Providing and laying **Open Graded Premix Surfacing of 20mm thick** composed of 13.2mm to 5.6mm coarse aggregates as per Table 500-23 @ 0.27 Cum/10Sqm, premixed with bituminous binder VG-30 grade Paving Bitumen complying with IS -73-2006 @ 14.6Kg/10Sqm in Batch / Hot mix plant, loading of aggregates with F.E. loader, transported to site in tipper to paver, laid over a previously prepared surface with **hydrostatic paver finisher with sensor control** to the required grade, level, alignment, rolling with smooth wheeled tandem roller 6-8 tonnes to achieve the desired compaction, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting etc complete,

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

except lead for Bitumen, with a lead of mixed material upto 1 Km, excluding cost of primer/tack coat.

A	<u>Using 100-120 TPH Batch mix plant</u>	Sqm	110.00
B	<u>Using 80-100 TPH Batch mix plant</u>	Sqm	103.00
C	<u>Using 40-60 TPH Hot mix plant</u>	Sqm	130.00

Note :- If Mechanical Paver finisher is used deduct Rs. 2.00/-Sqm for 5.10 C.

Case II
510.2 **Open - Graded Premix Surfacing**

Providing and laying **Open Graded Premix Surfacing of 20mm thick** composed of 13.2mm to 5.6mm as per Table 500-24 @ 0.27 Cum/10Sqm, premixed with **Cationic bituminous emulsion @ 21.5Kg/10Sqm** complying with IS 8887 in concrete mixer 0.4 Cum capacity, laid over a previously prepared surface **manually** to the required grade, level, alignment, rolling with Smooth wheeled roller 8-10 tonnes to achieve the desired compaction, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting, etc complete, except lead for Bitumen emulsion.

Sqm 151.00

5.11 508 **Close Graded Premix Surfacing/Mixed Seal Surfacing**

Providing and laying **Close Graded Premix Surfacing/Mixed Seal Surfacing** of 20mm thickness composed of stone aggregates as per Table 500-26, premixed with bituminous binder VG 30 grade paving bitumen complying with IS 73/IS 15462 in Batch / Hot mix plant, loading by F.E. loader, transported to site in tipper to paver, laid over a previously prepared surface with **hydrostatic paver finisher with sensor control** to the required grade, level, alignment, rolling with Smooth wheeled roller 8-10 tonnes to achieve the desired compaction, including cost of all materials, labour,

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		hire charges of machinery, lead, lifts, loading, unloading stacking, transporting etc., complete, except lead for Bitumen, with a lead of mixed material upto 1 Km, excluding cost of primer/tack coat.		
A		<u>Using 100-120 TPH Batch type Hot mix plant</u>		
	(i)	Type - A :- using crushed stone aggregates 11.20mm to 0.09 mm at 0.27 cum/10 Sqm & Bitumen binder @ 22 Kg/10 Sqm.		
	(a)	Using VG-30 grade Paving Bitumen	Sqm	130.00
	(b)	Using CRMB - 55 Grade	Sqm	135.00
	(ii)	Type - B :- using crushed stone aggregates 13.20mm to 0.09 mm at 0.27 cum/10 Sqm & Bitumen binder @ 19 Kg/10 Sqm.		
	(a)	Using VG-30 grade Paving Bitumen	Sqm	120.00
	(b)	Using CRMB - 55 Grade	Sqm	128.00
B		<u>Using 80-100 TPH Batch mix plant</u>		
	(i)	Type - A :- using crushed stone aggregates 11.20mm to 0.09 mm at 0.27 cum/10 Sqm & Bitumen binder @ 22 Kg/10 Sqm.		
	(a)	Using VG-30 grade Paving Bitumen	Sqm	124.00
	(b)	Using CRMB - 55 Grade	Sqm	129.00
	(ii)	Type - B :- using crushed stone aggregates 13.20mm to 0.09 mm at 0.27 cum/10 Sqm & Bitumen binder @ 19 Kg/10 Sqm.		
	(a)	Using VG-30 grade Paving Bitumen	Sqm	116.00
	(b)	Using CRMB - 55 Grade	Sqm	120.00
C		<u>Using 40-60 TPH Hot mix plant</u>		
	(i)	Type - A :- using crushed stone aggregates 11.20mm to 0.09 mm at 0.27 cum/10 Sqm & Bitumen binder @ 22 Kg/10 Sqm.		

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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(a) Using VG-30 grade Paving Bitumen Sqm 141.00

(b) Using CRMB - 55 Grade Sqm 152.00

(ii) **Type - B** :- using crushed stone aggregates 13.20mm to 0.09 mm at 0.27 cum/10 Sqm & Bitumen binder @ 19 Kg/10 Sqm.

(a) Using VG-30 grade Paving Bitumen Sqm 130.00

(b) Using CRMB - 55 Grade Sqm 134.00

Note :- If Mechanical Paver finisher is used for item No.5.11 C deduct Rs. 2.00/Sqm

5.12 511

Seal Coat

(i) **Seal Coat Type A**

Providing and laying **seal coat Type A** comprising of a layer of bituminous binder VG-30 grade Paving Bitumen (60/70 Grade) complying with IS.73-2013 @ 9.80 Kg / 10 Sqm applied using bituminous pressure distributor, followed by a cover of 6.7mm stone chippings of specified grading @ 0.09 Cum/ 10 Sqm, laid using hydraulic self propelled chip spreader, rolling with smooth wheeled roller 8-10 tonnes, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting, etc complete, except lead for Bitumen.

Sqm 53.00

(ii) **Premix Sand Seal Coat Type - B**

Providing and laying **Premix sand seal coat Type - B** composed of 6.7mm size stone aggregates @ 0.60 Cum/10 Sqm premixed with bituminous binder VG-30 grade Paving Bitumen (60/70 Grade) complying with IS.73-2013 @ 6.80 Kg / 10 Sqm in **Batch mix plant 100-120 TPH** capacity, loading by F.E. loader, transported to site in tipper to paver, laid over a previously prepared surface

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

with paver finisher hydraustatic with sensor device to the required grade, level, alignment, rolling with Smooth wheeled roller 8-10 tonnes to achieve the desired compaction including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading stacking, transporting etc., complete, except lead for Bitumen, with a lead of mixed material upto 1 KM.

Sqm 39.00

5.14 516

Mastic Asphalt

Providing and laying 25 mm thick **mastic asphalt** wearing course excluding tack coat with VG-40 Complying with IS.73-2013 (Industrial grade Bitumen) at an average of 15.50% bitumen coarse aggregate, fine aggregate and hydrated lime stone dust as filler, meeting the requirements given in table 500-39, 500-40, 500-41, 500-42 prepared by using mastic cooker and laid to required level and slope after cleaning the surface with Mechanical broom & dusting with Air compresor, including providing antiskid surface with VG-30 grade bitumen precoated hard stone chipping of 13.2 mm nominal size at the rate of 0.005cum/10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surface is not less than 100 Degrees, protruding 1 mm to 4 mm over mastic surface, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting, etc complete, except lead for Bitumen.

Sqm 665.00

Material	Metal	Bitumen VG-40	Bitumen VG-30	Filler Lime
Requirement:	0.027 Cum	8.86 Kg	0.0143 Kg	10.29 Kg

Note 1. The rates for 50 mm & 40 mm thick layers may be worked out on pro-rate basis.

2. Selection of grade of bitumen may be done as per the site condition. The difference in cost of bitumen may be added/subtracted.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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5.15 512

Slurry Seal

Providing and applying Slurry Seal for sealing of cracks, comprising of mixing of slow Setting Bituminous Emulsion IS 8887 with well graded fine aggregates, cement and water, mixing of slurry seal in a mobile slurry seal equipment, aggregates as per Table 500-27 and required quantity of water to prepare the slurry semi fluid homogenous mass with no emulsion run-off and for required consistency while laying. It shall be spread manually including cleaning of surface, the cracks to remove all dirt and vegetation using mechanical broom and dusting with air compressor, laying and compacting to provide even riding surface and shall be rolling by Pneumatic Tyre Roller and ensure that rutting or excessive movement does not occur, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting, etc complete, except lead for Emulsion.

(i) Type I 2.5 mm thickness Sqm 34.00

<i>Material Requirement:</i>	<i>Metal</i> 0.0018 Cum	<i>S.S Emulsion</i> 0.429 Kg	<i>Filler (Cement)</i> 0.0658 Kg
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(ii) Type II 5 mm thickness Sqm 59.00

<i>Material Requirement:</i>	<i>Metal</i> 0.00374 Cum	<i>S.S Emulsion</i> 0.726 Kg	<i>Filler (Cement)</i> 0.132 Kg
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(iii) Type III 7 mm thickness Sqm 82.00

<i>Material Requirement:</i>	<i>Metal</i> 0.00638 Cum	<i>S.S Emulsion</i> 0.99 Kg	<i>Filler (Cement)</i> 0.22 Kg
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Note Tack coat, if required to be provided, before laying slurry seal may be measured and paid separately

5.17

513.4.3

Fog Spray

Providing Fog spray by applying Slow Setting Bituminous Emulsion (SS1) without any aggregate cover at the rate an average of 0.75 Ltr/Sqm,

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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cleaning the surface with mechanical broom and dusting with air compressor, applying emulsion by bitumen pressure distributor for sealing the hair-line cracks less than 3mm wide after cleaning of cracks to remove all dirt, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting, etc complete, except lead for Emulsion.

Sqm 56.70

In case it is decided by the engineer to blind the fog spray, the following may be added

Providing and blinding Fog Spray mixing of Slow Setting Bituminous Emulsion @ 0.075 Kg/Sqm with well graded fine aggregates @ 0.0025Cum/Sqm spread manually, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting, etc complete, except lead for Emulsion.

Sqm 7.40

5.19 506

Sand Asphalt Base Course

Providing, laying and rolling sand-asphalt base course composed of sand as per table 500-14, filler @ 2% weight of aggregates and bituminous binder VG-30 grade Paving Bitumen complying with IS.73-2013 on a prepared sub-grade or sub-base to the lines, levels, grades and cross sections with paver finisher hydrostatic with sensor control, rolling with Smooth wheeled roller 8-10 tonnes, vibratory roller and smooth wheeled tandem roller as per clauses 501.6 and 501.7 as per drawings, loading with F.E. loader, mixing in Hot mix plant 60-80 TPH capacity, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading stacking, transporting etc., complete, except lead for Bitumen with a lead of mixed material upto 1 Km, excluding cost of primer /tack coat.

Cum 7690.00

<i>Material</i>	<i>Sand</i>	<i>Bitumen VG-30</i>	<i>Filler</i>
<i>Requirement:</i>	1.407 Cum	109.76 Kg	43.90 Kg

Note: Tack coat shall be measured and paid separately

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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5.21 517

Crack Prevention Courses

Providing and laying of a stress absorbing membrane over a cracked road surface, after cleaning with a mechanical broom & air Compressor, binder complying with IS 15462 sprayed by Bitumen Pressure Distributor, spreading of crushed stone aggregates with hydraulic chip spreader, sweeping the surface for uniform spread of aggregates compacting with smooth wheel roller and surface finished to conform to clause 902, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting, etc complete, except lead for CRMB - 55.

- (i) **Stress absorbing membrane (SAM) crack width less than 6 mm using CRMB-55 @ 9 kg/10 sqm &**

5.6 mm crushed stone aggregates @ 0.10 cum/10sqm

Sqm 53.00

- (ii) **Stress absorbing membrane (SAM) with crack width 6 mm to 9 mm using CRMB-55 at 11kg/10 sqm and 11.2 mm crushed stone aggregates @ 0.10**

cum/10 sqm

Sqm 59.00

- (iii) **Stress absorbing membrane (SAM) crack width above 9 mm and cracked area above 50% using CRMB-55 at the rate of 15kg/10 sqm and 11.2 mm**

crushed stone aggregates @ 0.12 cum/10 sqm

Sqm 78.00

Note In case 2nd coat is also required to be provided, material provided for the 2nd coat shall be as per table 500-47.

- (iv) **Bitumen impregnated geotextile**

Providing and laying a bitumen impregnated geotextile layer after cleaning the road surface with mechanical broom & air compressor, geotextile conforming to requirements of clause 701, 702, laid over a tack coat by bitumen pressure distributor @ 1.05 kg/sqm of paving grade bitumen VG-10 grade paving Bitumen compacting with pneumatic roller and constructed to

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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the requirement of clause 703.4.5, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting, etc complete, except lead for Bitumen.

Sqm 101.00

<i>Material Requirement:</i>	<i>Geo-Textile</i> 1.100 Sqm	<i>Bitumen VG-10</i> 1.05 Kg
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5.23 514

Micro surfacing layer

Providing and laying Micro surfacing course on existing pavement surface which is structurally sound (the surface showing the signs of premature ageing, aggregate loss, cracking, high degree of polishing etc, may not be considered to this work) comprising of aggregates conforming to Specification as per IRC SP 514 of 2013 modified bitumen emulsion 10% Filler cement 2% additive 0.5%, and water as per requirement mixing in a mobile micro surfacelaying machine / equipment, aggregates as per Table 500-27 and required quantity of water to prepare the MSM semi fluid homogenous mass with no emulsion run-off and for required consistency while laying. It shall be spread mechanically including cleaning of surface, to remove all dirt and vegetation using mechanical broom and dusting with air compressor, laying and compacting to provide even riding surface and shall be rolling by Pneumatic Tyre Roller and ensure excessive movement does not occur, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting, etc complete, except lead for Emulsion

- i) Grading-II 6 mm thick
- ii) Grading-III 8 mm thick

Sqm 116.00
Sqm 155.00

<i>Material Requirement :</i>	<i>Metal</i> Gr-II 0.008 Cum Gr-III 0.011 Cum	<i>Emulsion</i> 1.32 Kg 1.76 Kg	<i>Filler (Cement)</i> 0.24 Kg 0.32 Kg
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CHAPTER - 6

CEMENT CONCRETE PAVEMENT

Preamble :

- 1 High capacity Batch Mix Plants of 75 cum/hour (effective output) has been considered in the rate analysis of cement concrete pavement works.
- 2 Super plasticizer admixture has been provided to improve workability with reduced water cement ratio.
- 3 Cement 43 grade has been catered for the cement concrete pavement i.e., for pavement quality concrete to get higher strength
- 4 Slip form paver / Fixed form pavan has been catered for the top layer of concrete pavement, a mechanical paver has been provided for dry lean and rolled cement concrete.
5. Ministry letter F.No.RW/NH-3044/31/2014/S&R(R) Dated 13.04.2015, for exicution of regid payment Sl. No. 6.01, 6.02, 6.06 cement rates (ex-facroty) is to be considered. For material provider the website (www.inanpro.nic.in) lauched by Ministry may be reffered. For new NH Projects for incorporating Cement rates as offered by various cement manufacutres. (Difference in cement to be dedacted with centags [CP+OH] at 0.21% on cost of cement).

RCC mix design to be got approved before commencement of work as per clause 601.7, 601.8 & 602.3.5.

CHAPTER- 6

CEMENT CONCRETE PAVEMENTS

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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6.01 601

Dry Lean Cement Concrete Sub- base

Providing and Construction of dry lean cement concrete Sub- base over a prepared sub-grade with coarse and fine aggregate conforming to IS: 383, the size of coarse aggregate as per table 600-1, using Granite/Basalt/Trap metal & clean sieved approved fine aggregate or double washed crushed metal sand, after blending to be as per table 600-1, cement content at 150 kg/cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10 Mpa at 7 days, loading materials to batch mix plant by F.E. Loader, mixed in a batching plant at 75 Cum/hr transported to site in tipper to paver, laid with paver finisher with electronic sensor, to the required grade, level and alignment, compacting with 8-10 tonnes vibratory roller, joint cutting, finishing and curing including cost of all materials, labour, lead and lift, hire charges of machineries etc., complete with a lead of mixed

material upto 1 Km. (Compacted thickness)

Cum 3200.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	<i>150 Kg</i>	<i>0.45 Cum</i>	<i>0.90 Cum</i>

6.02 A 602

Cement Concrete Pavement

Providing and Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, coarse aggregate as per table 600-3, using Granite/Basalt/Trap metal & clean sieved approved fine aggregate or double washed crushed metal sand, loading materials to batch mix plant by F.E. Loader, mixed in a cement concrete batch mix plant 175 Cum/hour as per approved mix design, transported to site in transit truck agitator 5 Cum capacity, laid with Slip Form paver with electronic sensor, and DBI

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filling with selant, separation membrane, of impermeable plastic sheet of 125 micron debonding strip, dowel bar, to be painted with epoxy paint tie rod, super plastizer admixtures confirming to IS 9103-1995 curing compound as approved, finishing to the required grade, level and alignment, textured with texturing machine, finishing and curing including cost of all materials, labour, lead and lift, hire charges of machineries etc., complete with a lead of mixed material upto 1 Km. (Compacted thickness)

Cum 6065.00

602 B

602 Cement Concrete Pavement using fixed form

Providing and Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, coarse aggregate as per table 600-3, using Granite/Basalt/Trap metal & clean sieved approved fine aggregate or double washed crushed metal sand, loading materials to batch mix plant by F.E. Loader, mixed in a cement concrete batch mix plant 75 Cum/hour as per approved mix design, transported to site in transit truck agitator 5 Cum capacity, laid with a **fixed form** with steel sections, laid to grade & level, compacted with vibrators and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filling with selant, separation membrane, sealant primer, joint of impermeable plastic sheet of 125 micron debonding strip, dowel bar, to be painted with epoxy paint tierods, dowel bars to expansion joints to be laid manually, super plastizer admixtures confirming to IS 9103-1995 curing compound as approved, finishing to the required grade, level and alignment, texturing, finishing and curing including cost of all materials, labour, lead and lift, hire charges of machineries etc., complete with a lead of upto 1 Km. (Compacted thickness)

Cum 6000.00

Material	Cement	FA	Metal	Dowel bars	Tie Rods
Requirement:	400 Kg	0.45 Cum	0.90 Cum	9.00 Kg	1.114 Kg

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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6.03 A 602**White Topping**

Providing and laying White Topping as per IRC:SP76-2008 over prepared bituminous surface (Existing bituminous surface preparation to be done if necessary either by milling or levelling to correct surface profile, to be paid separately) with plain Cement Concrete pavement with 43 grade cement at 400 kg per cum coarse and fine aggregate conforming to IS 383, coarse aggregate as per table 600-3, using Granite/Basalt/Trap metal & clean sieved approved fine aggregate or double washed crushed metal sand, loading materials by F.E. Loader, cement concrete batch mix plant 175 Cum/hour as per approved mix design, with admixtures, transported to site, in transit mixer, laid with **slip form paver finisher with electronic sensor**, laid to grade & level, compacted with vibrators and finished in a continuous operation including groove cutting for grids / panel to a depth of 1/3 of the slab depth as per design, texturing, separation membrane, of impermeable plastic sheet of 125 micron joint filling with sealant, spraying two layers of curing compound, curing with water, finishing to lines and grades level and alignment, finishing and curing including cost of all materials, labour, lead and lift, hire charges of machineries etc., complete with a lead of mixed material upto 1 Km. (Compacted thickness)

Cum 5895.00

6.03 B 602**White Topping using fixed form**

Providing and laying White Topping as per IRC:SP76-2008 over prepared bituminous surface (Existing bituminous surface preparation to be done if necessary either by milling or levelling to correct surface profile, to be paid separately) with plain Cement Concrete pavement with 43 grade cement at 400 kg per cum coarse and fine aggregate conforming to IS 383, coarse aggregate as per table 600-3, using Granite/Basalt/Trap metal & clean sieved approved fine aggregate or double washed crushed metal sand, loading materials by F.E. Loader, cement concrete

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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batch mix plant 75 Cum/hour as per approved mix design, with admixtures, transported to site, in transit mixer, laid with a **fixed form** with steel sections, laid to grade & level, compacted with vibrators and finished in a continuous operation including groove cutting for grids / panel to a depth of 1/3 of the slab depth as per design, texturing, separation membrane, joint filling with sealant, spraying two layers of curing compound, curing with water, finishing to lines and grades level and alignment, finishing and curing including cost of all materials, labour, lead and lift, hire charges of machineries etc., complete with a lead of mixed material upto 1Km. (Compacted thickness)

Cum 5850.00

<i>Material Requirement:</i>	<i>Cement</i> 400 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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6.05 Suggestive

Construction of Base/Sub-Base of Pavement with Lean Concrete - Flyash.

Providing and Construction of Base/sub-base using cement, clean sieved approved fine aggregate or double washed crushed metal sand, flyash and 40mm & down size Granite/Basalt/Trap metal coarse aggregates proportioned as per table 4 of IRC: 74/1979 and with water content ratio, slump and compressive strength as defined in the said table, mix prepared in a batch mix plant 75 Cum/hour at OMC, transporting to site in tipper to paver, laying in hydraulic paver finisher with electronic sensor to the required grade, level and alignment, compacted with a vibratory roller 8-10 tonnes capacity within the time limit laid down vide clause 7.6.3 of IRC: 74-1979, construction joints properly formed at the end of day's work, cured for 14 days, all as specified in IRC: 74-1979, finishing, curing including cost of all materials, labour, lead and lift, hire charges of machineries etc, complete with a lead of mixed material upto 1 Km. (Compacted thickness)

Cum 2680.00

<i>Material Requirement:</i>	<i>Cement</i> 150 Kg	<i>FA</i> 0.247 Cum	<i>Metal</i> 0.90 Cum	<i>Fly Ash</i> 0.203 cum
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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Note: 1. Depending upon approved designs, crushed stone aggregates of nominal size 20mm can also be used as per gradation given in table 2 of IRC: 74-1979.

2. The ratio of specific gravities of fly ash and sand has been assumed to be 0.827.

3. Please refer premeable Sl.no.5 of this chapter.

6.06 Suggestive

Cement - Flyash Concrete Pavement.

Providing and Construction un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate as per table 600-3, using Granite/Basalt/Trap & clean sieved approved fine aggregate or double washed crushed metal sand, replacing cement by fly ash to the extent of 15 per cent and sand by 10 per cent, mixed in a batch mix plant 175 Cum/hour as per approved mix design, transported to site in transit truck agitator 5 Cum capacity, laid with slip form paver with electronic sensor, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures curing compound as approved, finishing to lines and grades, textured with texturing machine, as per drawing, curing including cost of all materials, labour, lead and lift, hire charges of machineries etc, complete with a lead of mix materials upto 1Km., except lead for flyash, (Compacted thickness)

Cum 5685.00

Material	Cement	FA	Metal	Fly Ash	Steel
Requirement:	340 Kg	0.405 Cum	0.90 Cum	103.81 Kg	10.11 Kg.

Note 1. IRC: 68-1976 may be referred for guidelines on the design of cement-fly ash concrete for rigid pavement construction.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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2. Design mix for Sl.No.6.02 to 6.06 may be got approved by the competent authority.

3. Please refere premeable Sl.no.5 of this chapter

6.07 addl

Providing and laying **heavy duty interlock paver concrete blocks** of 120mm thick using M40 grade concrete, confirming to IS 383, coarse agreegates 20mm & 10mm granite/basalt/trap metal, clean sieved fine agrigate or duble washed crushed metal sand, and using IRC approved admixture, casting the blocks to approved standard shape and colour with a minimum compressive strength of 40 N/Sq mm, laid over 50 mm thick sand bed (average thicknes) and compacting with vibrator having 3 tonne compaction force here by forcing the sand under neath to come up in between joints, final compaction of paver surface joints, in to its final level, incuding cost of material, labour, HOM of all machineries, complete as per specification.

(Pavement works)

Sqm

1200.00

CHAPTER - 7

Geosynthetic and Reinforced Earth

Preamble :

- 1 The specifications for geosynthetics which includes geotextiles, geogrids, geonets, geomembrane and geocomposites shall be as per section 700 of MoSRT&H Specifications.
- 2 The geotextile proposed for subsurface drain shall satisfy the requirements given in Clause 702.2.3
- 3 Care shall be taken to ensure that the geotextile or core material is not exposed to dry light for more than a cumulative total of 50 hours.
- 4 Bitumen overlay shall follow on the same day where paving fabric is laid.
- 5 Data rate may be prepared and got approved by the Superintending Engineer for essential items of this chapter.

CHAPTER-7

GEOSYNTHETICS AND REINFORCED EARTH

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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7.01 702 Sub-Surface Drain with Geotextiles

Construction of sub surface drain 200 mm dia using geotextiles treated with carbon black with physical properties as given in clause 702 formed in to a stable network and a planar geocomposite structure, joints wrapped with geotextile to prevent ingress of soil, including geonets, geomembrane 300 GSM and non woven geotextile to make planar geocomposite stable network for subsurface drain including wrapping of joints with 160mm overlapping with geotextile as per clause 702 and approved drawings including excavation and backfilling, cost of all labour, materials, hire charges of machinery, loading & unloading, lead and lift etc., complete.

Rmtr 660.00

Note : Surplus excavated material to be used at site. Hence seprate cost for disposal is not added.

7.02 702.3.2 Narrow Filter Sub-Surface Drain

Construction of a narrow filter sub surface drain consisting of porous or perforated pipe laid in narrow trench surrounded by a geotextile filter fabric, with a minimum of 450 mm overlap of fabric and installed as per clause 702.3 and 309.3 including excavation and backfilling, cost of all labour, materials, hire charges of machinery, loading & unloading, lead and lift etc.,complete.

Rmtr 760.00

7.03 A 708 Laying Paving Fabric Beneath a Pavement Overlay

Providing and laying paving fabric with physical requirements as per table 704-2 over VG-10 grade tack coat of paving grade Bitumen laid at the rate of 1 kg per sqm over thoroughly cleaned and repaired surface to provide a water resistant membrane and crack retarding layer. Paving fabric to be free of wrinkling and folding and to be laid before cooling

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		of tack coat, brooming and rolling of surface with pneumatic roller to maximise paving fabric contact with pavement surface as directed by Engineer in charge, including cost of all materials, labour, hire charges of Machinery, lead lifts, loading, unloading etc., complete	Sqm	60.00
7.03 B 708		Paving Fabric Beneath GSB Providing and laying paving fabric with physical requirements as per table 704-2 to provide a water resistant membrane. Paving fabric to be free of wrinkling and folding as directed by Engineer in charge, including cost of all materials, labour, hire charges of Machinery, lead lifts, loading, unloading etc., complete	Sqm	25.00
7.04 703		Laying Boulder Apron in Crates of Synthetic Geogrids Providing, preparing and laying of geogrid crated apron 1 m x 5 m, 600 mm thick including excavation and backfilling with baffles at 1 metre interval, made with geogrids having characteristics as per clause 704.2, joining sides with connectors/ring staples, top corners to be tie tensioned, placing of suitable cross interval ties in layers of 300 mm connecting opposite side with lateral braces and tied with polymer braids to avoid bulging, constructed as per clause 704.3. filled with stone with minimum size of 200 mm and specific gravity not less than 2.65, packed with stone spalls, keyed to the foundation recess in case of sloping ground and laid over a layer of geotextile to prevent migration of fines, all as per clause 704 and laid as per clause 2503.3 and approved design, as directed by Engineer in charge, including cost of all materials, labour, hire charges of Machinery, lead lifts, loading, unloading etc., complete.	Cum	550.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
7.05	3100, 3102	Reinforced earth structure		
	I)	Providing and laying in position M35 grade pre cast concrete facia panel / pre cast CC blocks, with architectural finish of suitable size and thickness as per approved drawing, but not less than minimum 140mm thick excluding architectural finishes and including TMT reinforcement bars Cement. (Earth work excavation for foundation, providing initial levelling pad (minimum 150mm thick and having suitable width) as necessary, using M15 grade plain cement concrete. PCC shall be taken separately as per site situation) necessary connection arrangements for soil reinforcement , necessary coping beam, neoprene sponge joint material between reinforced soil wall facia and crash barriers, the backfill material and the drainage material shall be separated using permeable non-woven (geotextile or synthetic geo grid) as per clause 3102.8 and approved design, necessary anchor rods at the toe of wall for laying first pre cast panel. Including all materials, labour, lead and lift, hire charges of all plants, machinery, complete complying with Technical specifications clause 3100 of MORTH specifications. (unit Sqm) Machinery, lead lifts, loading, unloading etc., complete.	Sqm	1218.00
	II)	Assembling, joining and laying of soil reinforcing elements strip of 60x5 mm, connecting with precast facia panels, including connecting arrangements, necessary anti corrosive coating, all materials, labour, lead and lift, plants a plants, machinery, complete as per the direction of the Engineer – in-charge and complying with Technical specifications clause 3100 of MORTH specifications.		
	a)	Anti corrosive galvanised steel strips	Rmt	151.00
	b)	Aluminium strips	Rmt	58.40
	c)	Stainless Steel strips	Rmt	818.00
	d)	Polymeric strips	Rmt	234.00
	III)	Assembling, joining and laying of soil reinforcing elements connecting with precast modular blocks, including connecting arrangements, all materials, labour, lead and lift, hire charges of machinery, complete, complying with Technical specifications clause 3100 of MORTH specifications.		
	a)	Synthetic Geogrid	Sqm	387.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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- NOTE:-**
1. Drainage arrangement shall be made as per approved design and drawings.
 2. The quantity of filler media shall be calculated as per approved design and specifications and shall be priced separately.
 3. Excavation for foundation including foundation concrete and groove in the foundation for seating of bottom most fascia panel and capping beam to be calculated as per design and priced separately.
 4. The earth fill to be retained is not included in this analysis. The same is to be worked out and provided separately complete as per clause 305.
 5. For compaction of Earthwork, attention is invited to clause 3105.5 of MoRTH Specification.
 6. Length of reinforcing strips will vary with the height of wall and will be as per approved design and drawings.
 7. The type of reinforcing elements to be adopted shall be as per approved design and specifications.
 8. The earth fill material shall be clean, free draining, granular with high friction and low cohesion, non-corrosive, coarse grained with not 10 per cent of particles passing 75 micron sieve, free of any deleterious matter, chlorides, salts, acids, alkalies, mineral oil, fungus and microbes and shall be of specified PH value.
 9. Capping beam is to be priced separately as per approved design.
 10. All designs and quality of materials are to be got approved from competent authority before commencement of work, with trial run for minimum of 3.00 mtrs height.

CHAPTER - 8

TRAFFIC SIGNS, MARKINGS AND OTHER ROAD APPURTENANCES

Preamble :

- 1 Kerb stone laying and road marking has been provided for laying by mechanical means.
- 2 Backfilling of foundation of boundary pillars has been proposed with stone spalls, tightly packed and compacted.
- 3 The item pertaining to road traffic signals has not been analysed as this is a specialized work and rates can be obtained from firms having specialization for design and installation of this work.
- 4 Two supports have been provided for direction and place identification signs where size is more than 0.9 sqm. Only one support is Mprovided for size upto 0.9 sqm.
- 5 The traffic signs proposed are of high intensity grade micro prismatic type IV and micro prismatic type XI sheeting fixed over almunium sheeting or Almunium composite panel. The size, location of traffic signs and installation shall be as per IRC:67-2012.
- 6 Provision has been made for a crane for installation of overhead signs.
- 7 The reflectivity warrenty must be as per IRC:67-2012.

CHAPTER-8

TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

8.01	409	Cast in Situ Cement Concrete M20 Kerb Providing and Construction of cement concrete kerb with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M-10 grade foundation 150 mm thick, foundation using 20mm Granite/Basalt/Trap metal & clean sieved approved sand having 50 mm projection beyond kerb stone, kerb stone laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408 as per drawings, formwork, curing, including cost of all materials, labour, hire charges of machinery, loading, unloading, lead and lift, transporting etc., complete.			
		Using Concrete Mixer / Batching Plant	Rmtr	273.00	

Note : 1Km. mix lead is considered

8.02	409	Cast in Situ Cement Concrete M 20 Kerb with Channel Providing and Construction of cement concrete kerb with channel with top and bottom width 115 and 165 mm respectively, 250 mm high in M 20 grade PCC on M10 grade foundation 150 mm thick, using 20mm Granite/Basalt/Trap metal & clean sieved approved sand, kerb channel 300 mm wide, 50 mm thick in PCC M20 grade, sloped towards the kerb, kerb stone with channel laid with kerb laying machine, foundation concrete laid manually, all complete as per clause 408 as per drawings, formwork, curing, including cost of all materials, labour, hire charges of machinery, loading, unloading, lead, lift, transporting etc., complete .			
		A Using Concrete Mixer / Batching Plat	Rmtr	525.00	

Note : 1Km., mix lead is considered to Sl.No. 8.01 & 8.02

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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8.03 801

Printing New Letter and Figures of any Shade

Printing new letter and figures of any shade with synthetic enamel paint black or any other approved colour to give an even shade, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

- | | | | |
|------|--|--------------------------------|------|
| (i) | Hindi (Matras commas and the like not to be measured and paid for. Half letter shall be counted as half) | per
cm height
per letter | 1.10 |
| (ii) | English and Roman (Hyphens and the like not to be measured and paid for) | per
cm height
per letter | 0.66 |

8.04 801

Retro-Reflectorised Traffic Signs

Providing and fixing of retro- reflectorised cautionary, mandatory and informatory sign as per IRC:67-2012 including lettering fixed over aluminium sheeting, 2 mm or aluminium composite panel 4 mm thick firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing. The item includes earthwork excavation, Cement Concrete M-15 grade, 2 coats of approved colour synthetic enamel painting to the steel surface with black and white paint to poles 30cm alternate as per clauses, including curing, cost of all materials, labour, loading, unloading, lead, lift, transportation etc., complete. reflectivity warrenty as per IRC:67-2012

A supported on a class B GI pipe 80 mm outer dia, 3.50 mtrs hight (min. effective hight 1.90 mtrs) made of high intensity grade Micro Prismatic type IV sheeting, as per table 6.6.

- | | | | |
|------|----------------------------|------|---------|
| (i) | 90 cm equilateral triangle | Each | 4080.00 |
| (ii) | 60 cm equilateral triangle | Each | 3040.00 |

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.
		(iii) 60 cm circular	Each	3720.00	
		(iv) 80 cm x 60 cm rectangular	Each	4770.00	
		(v) 60 cm x 45 cm rectangular	Each	3650.00	
		(vi) 60 cm x 60 cm square	Each	4130.00	
		(vii) 90 cm high octagon	Each	5800.00	
		(viii) 90 cm x 30 cm rectangular hazard	Each	3790.00	
		(ix) 50 cm x 60 cm rectangular single chevron normal	Each	3950.00	
		(x) 75 cm x 90 cm rectangular single chevron	Each	5950.00	
		(xi) 155 cm x 90 cm rectangular double chevron	Each	9790.00	
		(xii) 230 cm x 90 cm rectangular triple chevron	Each	13390.00	
B supported on a class B GI pipe 80 mm outer dia, 3.50 mtrs high (min. effective height 1.90 mtrs) made of Micro Prismatic retro reflecting type XI sheeting, as per table 6.9					
		(i) 90 cm equilateral triangle	Each	4190.00	
		(ii) 60 cm equilateral triangle	Each	3090.00	
		(iii) 60 cm circular	Each	3810.00	
		(iv) 80 cm x 60 cm rectangular	Each	4920.00	
		(v) 60 cm x 45 cm rectangular	Each	3730.00	
		(vi) 60 cm x 60 cm square	Each	4240.00	
		(vii) 90 cm high octagon	Each	6005.00	
		(viii) 90 cm x 30 cm rectangular hazard	Each	3870.00	
		(ix) 50 cm x 60 cm rectangular single chevron normal	Each	4050.00	
		(x) 75 cm x 90 cm rectangular single chevron	Each	6160.00	
		(xi) 155 cm x 90 cm rectangular double chevron	Each	10220.00	
		(xii) 230 cm x 90 cm rectangular triple chevron	Each	14030.00	

Note:- 1. The depth of foundation and quantity of cement concrete in the foundation are indicative. These may be increased for areas having higher wind velocities like in coastal areas. This is applicable to all road signs and directions boards.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

H.05 801

Direction and Place Identification Signs upto 0.9 sqm Size Board.

Providing and erecting direction and place identification retro-reflectorised sign as per IRC:67-2012 fixed over aluminium sheeting, 2 mm or aluminium composite panel 4 mm thick with area not exceeding 0.9 sqm firmly fixed to the ground by means of properly designed foundation with M15 grade cement concrete 45x45x60cm, 60cm below ground level as per approved drawing The item includes earthwork excavation, Cement Concrete M-15 grade, 2 coats of approved colour synthetic enamel painting to the steel surface, as per clauses, including curing, cost of all materials, labour, loading, unloading, lead, lift, transportation etc., complete. reflectivity warrenty as per IRC:67-2012

- | | | | |
|---|---|-----|---------|
| A | supported on a class B GI pipe 80 mm outer dia, 3.50 Mtrs long made of high intensity grade Micro Prismatic type IV sheeting, as per table 6.6. | Sqm | 7750.00 |
| B | supported on a class B GI pipe 80 mm outer dia, 3.50 Mtrs long made of Micro Prismatic retro reflecting type XI sheeting, as per table 6.9 | Sqm | 8050.00 |

Note : Lettering and arrow marks on sign board to be provided separately as per actual requirement. Rates for these items have been analysed separately

H.06 801

Direction and Place Identification Signs with size more than 0.9 sqm size Board.

Providing and erecting direction and place identification retro- reflectorised sign as per IRC :67-2001 fixed over aluminium sheeting, 2 mm thick with area exceeding 0.9 sqm firmly fixed to the ground by means of properly designed foundation with M 15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing. The item includes earthwork excavation, Cement

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		Concrete M-15 grade, 2 coats of approved colour synthetic enamel painting to the steel surface, as per clauses, including curing, cost of all materials, labour, loading, unloading, lead, lift, transportation etc., complete. reflectivity warrenty as per IRC:67-2012		
	A	supported on 2 Nos. of class B GI pipe 80 mm outer dia, of length 3.50 Mtrs made of high intensity grade Micro Prismatic type IV sheeting, as per table 6.6.	Sqm	8200.00
	B	supported on 2 Nos. of class B GI pipe 80 mm outer dia, of length 3.50 Mtrs made of Micro Prismatic retro reflecting type XI sheeting, as per table 6.9	Sqm	8500.00
	<p>Note 1. Including lettering and arrow marks on sign board to be provided as per actual requirement.</p> <p>2. Area weightage on 8.04, 8.05, 8.06 is not applicable</p>			
8.07	802	Overhead Signs		
		Providing and erecting overhead signs with corrosion resistant 2mm thick aluminium alloy sheet reflectorised with vertical and lateral clearance given in clause 802.2 and 802.3 and installed as per clause 802.7 over a designed support system of aluminium alloy or galvanised steel trestles and trusses of sections and type as per structural design requirements and approved plans, including cost of all materials, labour, hire charges of machinery, loading, unloading, lead, lift, transporting etc., complete.		
	A	Truss and Vertical Support	Tonne	66500.00
	B	Aluminium Alloy Plate for Over Head Sign made of high intensity grade Micro Prismatic type IV sheeting, as per table 6.6.	Sqm	5470.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
C		Aluminium Alloy Plate for Over Head Sign made of Micro Prismatic retro reflecting type XI sheeting, as per table 6.9	Sqm	5770.00
Note				
1. The cost of excavation and foundation concrete for fixing of vertical support system to be worked out separately as per the approved drawing/design and to be included in the estimate.				
2. Including lettering and arrow marks on sign board to be provided as per actual requirement.				
3. Sl.no. 8.4 to 8.7 should be maintained as per clause 12 of IRC 67-2012.				
8.08	803	Painting Two Coats on New Concrete Surfaces		
Painting two coats after filling the surface with synthetic enamel paint in all shades on new plastered concrete surfaces, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.			Sqm	80.00
8.09	803	Painting on Steel Surfaces		
Providing and applying two coats of ready mix paint of approved brand on steel surface after through cleaning of surface to give an even shade including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.			Sqm	75.45
8.10	803	Painting on Wood Surfaces		
Providing and applying two coats of ready mix paint of approved brand on wood surface after thorough cleaning of surface to give an even shade including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.			Sqm	82.85

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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8.11 803

Painting Lines, Dashes, Arrows etc on Roads in Two Coats on New Work

Painting lines, dashes, arrows etc on roads in two coats on new work with ready mixed road marking paint conforming to IS:164 on bituminous surface, cleaning the surface of dirt, dust and other foreign matter, demarcation at site, barricading for traffic diversion traffic control including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

(i) Over 10 cm in width

Sqm 146.00

(ii) Up to 10 cm in width

Sqm 125.00

8.12 803

Painting Lines, Dashes, Arrows etc on Roads in Two Coats on Old Work

Painting lines, dashes, arrows etc on roads in two coats on old work with ready mixed road marking paint conforming to IS: 164 on bituminous surface, cleaning the surface of dirt, dust and other foreign matter, demarcation at site, barricading for traffic diversion, traffic control including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

(i) Up to 10 cm in width

Sqm 102.00

(ii) Over 10 cm in width

Sqm 110.00

8.13 803

Road Marking with Hot Applied Thermoplastic Compound with Reflectorising Glass Beads on Bituminous Surface

Painting the road surface using approved quality **Thermo Plastic material** (homogeneously composed of aggregates, pigment, resins and glass reflectorising beads) conforming to Clause-803.4.2.2 applied hot either by screeding or extension process at the rate of mentioned area of painted surface using suitable machine capable of controlled preparation and laying with surface applicator of glass beads at 250gms/sqmtr allowing cooling to ambient

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.	
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pavement temperature, that shall produce an adherent pavement marking of minimum specified thickness including barricading for traffic diversion as per IRC:35 cleaning the surface of dirt, dust and other foreign matter, demarcation at site, barricading for traffic diversion, traffic control including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

a)	5.50 kg per Sqm 2.5 mm thick	Sqm	528.00
b)	16.50 kg per Sqm 7.5 mm thick	Sqm	1500.00
c)	22.00 kg per Sqm 10 mm thick	Sqm	1990.00

Note 1. A sealing primer may be applied in advance on cement concrete pavement to ensure proper bonding. Any laitance and/or curing compound to be removed where paint is required to be applied on concrete surface.

2. Area weightage on 8.13 is not applicable

8.14 805

Kilometre Stone

Providing and fixing Reinforced cement concrete M15 grade Kilometre stone of standard design as per IRC:8-1980 and IRC:26, excavation and fixing in position in M-15 concrete, plastering the exposed faces with C.M. 1:2, curing painting and printing letters, necessary reinforcements etc including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

(i)	5th kilometre stone (precast)	Each	3680.00
(ii)	Ordinary kilometer stone (precast)	Each	2230.00
(iii)	Hectometer stone (precast)	Each	620.00

Note The rate for excavation, cement concrete, steel reinforcement, painting and lettering are included in this item of work.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
8.15	806	<p>Road Delineators</p> <p>Providing, Supplying and installation of delineators (road way indicators, hazard markers, object markers), 80-100 cm high above ground level, painted black and white in 15 cm wide strips, fitted with 80 x 100 mm rectangular or 75 mm dia circular reflectorised panels at the top, buried or pressed into the ground and conforming to IRC-79 as per drawings including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.</p>	Each	310.00
<p>Note 1. In case of soft ground, a proper foundation may be provided as per approved design. In case foundation is required to be provided, the items of excavation and foundation concrete are required to be measured and paid separately.</p> <p>2. Area weightage on 8.15 is not applicable</p>				
8.16	807	<p>Boundary pillar</p> <p>Providing and fixing Reinforced cement concrete M15 grade boundary pillars of standard design as per IRC:25-1967, excavation and fixing in position in M-15 concrete plastering the exposed faces with CM 1:2, painting and printing letters, necessary reinforcement etc., including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.</p>	Each	600.00
<p>Note In case of soft ground, a proper foundation may be provided as per approved design. In case foundation is required to be provided, the items of excavation and foundation concrete are required to be measured and paid separately.</p>				
8.17	808	<p>G.I Barbed Wire Fencing 1.2 Metre High</p> <p>Providing and fixing 1.2 metres high GI barbed wire fencing with 1.8 m angle iron posts 40 mm x 40 mm x 6 mm placed every 3 metres center to center</p>		

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be struted on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 807 painting to steel angles two coats, barbed wire weight 9.38 Kg/100m shall be used horizontally at 13 Cm Centre to Centre and diagonally 2 Nos including G.I. Staple, binidng wire, drilling holes including cost of all materials, labour, lead, lift, hire charges of machineries transportation etc., complete.

Rmtr 210.00

8.18 808

G.I Barbed Wire Fencing 1.8 Metre High

Providing and fixing 1.8 metres high GI barbed wire fencing with 2.4 metre angle iron posts 50 mm x 50 mm x 6 mm placed every 3 metres center to center founded in M15 grade cement concrete, 0.6 metre below ground level, every 15th post, last but one end post and corner post shall be struted on both sides and end post on one side only and provided with 12 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc complete as per clause 807 including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Rmtr 345.00

Note Cost of excavation for foundation and foundation concrete to be added separately in the cost estimate as per approved design.

8.19 Suggestive

Fencing With Welded Steel Wire Fabric 75 mm x 50 mm

Providing and fixing 1.20 metre high fencing with angle iron posts 50 mm x 50 mm x 6 mm at 3 metre center to center with 0.40 metre embedded in M15 grade cement concrete, corner, end and every 10th post to be struted, provided with welded steel wire fabric of 75 mm x 50 mm mesh and fixed to iron

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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posts by flat iron 50 x 5 mm and bolts etc. complete in all respects painting 2 coats, drilling holes, nuts & bolts, welding consumably including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Rmtr 490.00

Note The item of excavation and cement concrete in foundation shall be measured and paid separately

8.20 809

Tubular Steel Railing on Medium Weight Steel Channel (ISMC series) 100 mm x 50 mm

Providing, fixing and erecting 50 mm dia steel pipe railing in 3 rows duly painted on medium weight steel channels (ISMC series) 100 mm x 50 mm, 1.2 metres high above ground, 2 m centre to centre, complete as per approved drawings including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Rmtr 1630.00

8.21 809

Tubular Steel Railing on Precast RCC Posts, 1.2 m High Above Ground Level

Providing, erecting and fixing fencing 50 mm dia painted steel pipe railing in 3 rows on precast M20 grade RCC vertical posts 1.8 metres high (1.2 m above GL) with 3 holes 50 mm dia for pipe, fixed 2 metres centre to centre, complete as per approved drawing including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Rmtr 1260.00

8.22 811

Reinforced Cement Concrete Crash Barrier

- a) Providing and fixing Reinforced cement concrete crash barrier at the edges of the road, approaches to bridge structures and medians, constructed with cement concrete with TMT Steel of Grade FE 500 reinforcement conforming to IRC:21, dowel bars 25 mm dia, 450 mm long at expansion joints filled with pre-moulded asphalt filler board, keyed to the structure on which it is built and installed as per design given in the enclosure to MoSRT&H

Rate Rs. Ps.	Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
					Rs.	Ps.
00.00			Circular No. RW/NH - 33022/1/94-DO III dated 24 June 1994 as per dimensions in the approved drawing and at locations directed by the Engineer, all as specified including earthwork, Cement Concrete, cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.			
			a) Using M 25 Grade concrete	Rmtr	2950.00	
			b) Using M 40 Grade concrete	Rmtr	3000.00	
823	810		Metal Beam Crash Barrier			
	A		Type - A, "W" : Metal Beam Crash Barrier			
			Providing, erecting and fixing "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete including earth work for foundation, back filling, compacting in layers, cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Rmtr	2420.00	
	B		Type - B, "THRIE" : Metal Beam Crash Barrier			
			Providing, erecting and fixing "Thrie" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 85 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 2 m high with 1.15 m below ground level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a space of channel section 150 x 75 x 5 mm, 546 mm long complete including earth work for foundation, back filling, compacting in layers, cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Rmtr	3050.00	

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs.
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Note: i. Excavation and backfilling are incidental to work and not to be measured separately. 8.23 A & B

8.25 811

Flexible Crash Barrier, Wire Rope Safety Barrier

Providing, erecting and fixing a wire rope safety barrier with vertical posts of medium weight RS Joist (ISMB series) 100 mm x 75 mm (11.50 kg/m), 1.50 m long 0.85 m above ground and 0.65 m below ground level, split at the bottom for better grip, embedded in M 15 grade cement concrete 450 x 450 x 450 mm, 1.50 m centre to centre and with 4 horizontal steel wire rope 40 mm dia and anchored at terminal posts 15 m apart. Terminal post to be embedded in M 15 grade cement concrete foundation 2400 x 450 x 900 mm (depth), strengthened by a strut of RS joist 100 x 75 mm, 2 m long at 45 degree inclination and a tie 100 x 8 mm, 1.50 m long at the bottom, all embedded in foundation concrete as per approved design and drawing, rate excluding excavation and cement concrete including earth work for foundation, back filling, compacting in layers, cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Rmtr 1730.00

Note 1. The items of excavations and cement concrete works will be measured and included separately as per the approved designs and drawings.

8.26

B Anti-glare screen with 25 mm steel pipe framework fixed with circular and rectangular vans

Providing and erecting an anti - glare screen with 25 mm dia vertical pipes fabricated and framed in the form of panels of one metre length and 1.75 metre height fixed with circular vane 250 mm dia at top and rectangular vane 600 x 300 mm at the middle, made out of steel sheet of 3 mm thickness, end vertical pipes of the panel made larger for embedding in foundation concrete, applying 2 coats of paint on all exposed surfaces, all as per approved design and drawings including cost of all materials, labour,

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

loading, unloading, lead, lift, transporting etc., complete.

Rmtr 840.00

Note The items of excavation and cement concrete as per approved design to be measured and paid separately

C Anti-glare screen with rectangular vane of MS sheet

Providing and erecting anti - glare screen with rectangular vanes of size 750 x 500 mm made from MS sheet, 3 mm thick @ 24 Kg/Sqm and fixed on MS angle 50 x 50 x 6 mm , 2.35 Mtr length at an angle of 45 degree to the direction of flow of traffic, 1.5 m center to center, top edge of the screen 1.75 m above ground level, vertical post firmly embedded in M-15 cement concrete foundation 0.60 m below ground level, applying 2 coats of paint on all exposed faces, complete as per approved design and drawings including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Rmtr 710.00

Note The items of excavation and cement concrete as per approved design to be measured and paid separately. Rate of painting has been analysed separately in this chapter.

8.27 Suggestive Street Lighting

Providing and erecting street light mounted on a steel circular hollow pole of standard specifications for street lighting, 9 m high spaced 40 m apart, 1.8 m overhang on both sides if fixed in the median and on one side if fixed on the footpath, fitted with sodium vapour lamp 70 Watts / LED 250 Watts and fixed firmly in concrete foundation including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

(i)	For fixing in Median	Each	12000.00
(ii)	For fixing in Footpath	Each	10750.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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Note The items of excavation and cement concrete foundation will be measured and included separately in the estimate as per approved design and drawing.

8.28 Suggestive Lighting on Bridges

Providing and fixing lighting on bridges, mounted on steel hollow circular poles of standard specifications, 5 m high fixed on parapets with cement concrete, 20 m apart and fitted with sodium vapour lamp 70 Watts & fixed firmly in Cement Concrete foundation including Aluminium painting of approved colour including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Each 7050.00

Note The items of cement concrete to be measured and paid separately as per approved design.

8.29 Suggestive Cable Duct Across the Road

Providing and laying of a reinforced cement concrete NP-3 pipe duct, 300 mm dia, across the road (new construction), extending from drain to drain in cuts and toe of slope to toe of slope in fills, constructing head walls at both ends, providing a minimum fill of granular material over top and sides of RCC pipe as per IRC:98-2015, bedded on a 0.3 m thick layer of granular material free of rock pieces, outer to outer distance of pipe at least half dia of pipe subject to minimum 450 mm in case of double and triple row ducts, joints to be made leak proof, invert level of duct to be above higher than ground level to prevent entry of water and dirt as per approved drawings including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

- (i) Single row for one utility service
- (ii) Double row for two utility services
- (iii) Triple row for three utility services

Rmtr 2000.00
Rmtr 3680.00
Rmtr 5380.00

Note 1. Inspection chamber at both ends is the responsibility of the agency who is laying the duct.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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2.The rates for stone masonry / brick masonry and cement Concrete to be adopted from respective clauses.

8.33 804 Gantry Mounted Variable Message Sign Board

Providing and erecting gantry mounted variable message sign board electronically operated capable of flashing the desired message over a designed support system of aluminium alloy or galvanised steel, erected as per approved design and drawings and with lateral clearance as per clause 802.3 including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Gantry Support System

Tonne 64000.00

8.34 Suggestive Traffic Impact Attenuators at Abutments and Piers

A With Scrap Tyres

Providing and installation of traffic attenuators at abutment/pier of flyovers bridges using scrap tyres of size 100 x 20 retrieved from trucks laid in 2 rows and 4 tiers, one above the other and tied with 20 mm wire rope as per approved design and drawings including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Sqm 1370.00

B Using Steel Barrel, Filled with Sand

Providing and installation of traffic impact attenuator at abutment/pier of flyovers bridges using steel barrels 0.60 m dia and 1.0 m in height, filled with sand in three rows and tied with 20 mm steel wire rope as per approved design and drawings including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Sqm 1265.00

C With HI - DRO cell Sandwich (Patented)

Providing and installing a patented HI - DRO cell system as a traffic impact attenuators, using plastic tubes 50 cm dia, 1.2 m in height, 25 mm opening at the top, placed in three rows, filled

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		with water and tied with a 20 mm steel wire rope including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Sqm	795.00
		(In this patented HI - DRO cell system, water gets discharged from plastic tubes on impact over a pre-determined time, thus absorbing the energy)		
8.35	Suggestive	Road Studs with Lense Reflector Providing and fixing of road stud 100x 100 mm, die-cast in aluminium, resistant to corrosive effect of salt and grit, fitted with lense reflectors, installed in concrete or asphaltic surface by drilling hole 30 mm upto a depth of 60 mm and bedded in a suitable bituminous grout or epoxy mortar, all as per BS 873 part 4:1973 including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Each	348.00
8.35A		Road Studs with Lense Reflector Providing and fixing of Reflective Raised Pavement marker (RPM's)/ Cat eyes/ Road studs conforming to ASTM D4280 type H, having reflective panels made of prismatic lens of total with a height of 20mm, size of 130 mm X 150 mm and reflecting area of 13 Sqcm with the slope of retro reflective surface the RPM's should be fixed by using two numbers of polymetric shanks using appropriate adhesive as recommended and certified by the RPM manufacturer. The raised pavement marker should support a sufficient minimum load 13635 Kg in accordance with ministry specification. The test certificates of the product and purchase lots certificate issued by the supplier should be produced at the time of billing. The RPM's should be got approved by the Engineer in charge of work before fixing at site. The cost is inclusive of all lead lift, transportation, labour, fixing in position firmly, as per the directions and instructions of the Engineer in charge of work. reflectivity warrenty as per IRC:67-2012	Each	278.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
8.36	Suggestive	Traffic Cone Providing of red fluorescent with white reflective sleeve traffic cone made of low density polyethylene (LDPE) material with a square base of 390 x 390 x 35 mm and a height of 770 mm, 4 kg in weight, placed at 1.5 m interval, all as per BS 873 including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Each	414.00
8.38	Suggestive	Rumble Strips Providing and constructing of 5 to 15 nos rumble strips covered with Bituminous Concrete, 15-20 mm high at center, 250 mm wide placed at 1 m center to center at approved locations to control speed, marked with white strips of road marking paint.	Sqm	—
<p>Note:- 1. The rate per sqm of Bituminous concrete and road marking may be adopted from chapter 5 & 8 respectively for the quantities calculated from approved drawings.</p> <p>2. Add 25% Extra for accuracy and finishing.</p>				
8.43	813.6	Portable Barricade in Construction Zone Installation of a steel portable barricade with horizontal rail 300 mm wide, 2.5 m in length fitted on a 'A' frame made with 45 x 45 x 5 mm angle iron section, 1.5 m in height, horizontal rail painted (2 coats) with yellow and white stripes, 150 mm in width at an angle of 45 degree, 'A' frame painted with 2 coats of yellow paint, complete as per IRC:SP:55-2001 including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Each	2500.00
8.44	813.6	Permanent Type Barricade in Construction Zone A With steel components Construction of a permanent type barricade made of steel components, 1.5 m high from road level,		

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		fitted with 3 horizontal rails 200 mm wide and 4 m long on 50 x 50 x 5 mm angle iron vertical support, painted with yellow and white strips, 150 mm in width at an angle of 45 degree, complete as per IRC:SP:55-2001 including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Each	3900.00
		B With wooden components		
		Construction of a permanent type barricade made of wooden components, 1.5 m high from road level, fitted with 3 horizontal planks 200 mm wide and 3.66 m long on 100 x 100mm wooden vertical post, painted with yellow and white strips, 150 mm in width at an angle of 45 degree, complete as per IRC:SP:55-2001 including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Each	7320.00
		C With bricks		
		Construction of a permanent type barricade made with brick work in mud mortar, 1.5 m high, 4 m long, 600 mm thick, plastered with cement mortar 1:6, painted with yellow and white strips 150mm in width at an angle of 45 degree complete as per IRC:SP:55-2001. Including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Each	18600.00
8.45 813.5		Drum Delineator in Construction Zone		
		Provision of metal drum/empty bitumen drum delineator, 300 mm in diameter, 800 mm high, filled with earth for stability, painted in circumferential strips of alternate black and white 100 mm wide 2 Coats fitted with reflectors 3 Nos of 7.5 cm dia, all as per IRC:SP:55-2001 including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Each	520.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
8.46	813.8	Flagman Positioning of a smart flagman with a yellow vest and a yellow cap and a red flag 600 x 600 mm securely fastened to a staff 1 m in length for guiding the traffic including cost of all materials, labour, transporting etc., complete.	Each	553.00
8.47	Additional	Median Marker Providing fixing Median Marker made of tough, high impact resistant injection moulded thermoplastic body with an isosceles trapezoidal structure of length 15cm, height and width of 10x10 cm and not less than 1.8 mm thick. The body shall be rounded as its acute angle, all the corners and edges. The plastic used for molding the median marker shall have impact strength value of 600 J/M at room temperature.. The Median Marker shall have rectangular shape fluorescent yellow colour retro-reflective sheeting of size not less than 8.5x8.5 cm with fully reflective micro prismatic cube corners as its retro-reflective elements meeting ASTM D4956 type XI specifications. The retro -reflective sheeting shall be on both side of the median marker, edge protected with edge lifting, sheeting damage etc. The logo of the manufacture shall be embossed on either side of the body of mould. The Median marker shall be fixed by a combination of epoxy adhesive and grouting. This is including of all labour, transportation fixing and finishing neatly as per the directions of engineer incharge of work.	Each	500.00
8.48	Addl	Aluminum backed Flexible Prismatic Sheeting (for trees, parapets, retaining wall etc) Providing and fixing Aluminum backed Reflective Prismatic Sheeting, consist of yellow/black coloured flexible prismatic sheet with non-metalic Prismatic lens as retro-reflective elements and conforming to ASTM D4957 type VI specification for reboundable		

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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retro-reflective sheeting. The prismatic sheet shall be laminated at the back with 50 micro Aluminum Foil sensitive adhesive and liner with screen printed arrow/slant line pattern in yellow/black colour. The shall be applied with adhesive, the edge of the sheeting shall be sealed all around with epoxy based structural adhesive and shall be extremely resistant to peel-off. This is including of all labour, transportation fixing and finishing neatly as per the directions of engineer incharge of work.

Sqm 4400.00

8.49 Addl

Project Display Board of size 1.80 x 1.60 and 2.8M from ground level.

Providing and erecting Project Display Board of size 1.80 verticalx1.60M Horizontal made of Cold Rolled Coil Sheet 16 Guage (1.6mm thickness) sheeting sthrengthened by welding to MS angle of size 35x35x5mm iron framework on all sides, extra cross vertical angle fixed using nuts and bolts, base of the board shall be cleaned, applying red oxide and black paint by sprayer on both sides of the board and all MS iron frameworks, background of the facing side of the board painted in traffic yellow, project information written in English/Kannada/Hindi, painting letters and numerals in black, fixed on a mild steel angle iron post 75 mm x 75 mm x 6 mm, 2 Nos. firmly fixed to the ground by means of properly designed foundation with M 15 grade cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level and the board 2.8M from ground level as per approved drawing (Excluding cost of lettering)

Each 7900.00

Note : Area weighthage on Items 8.35, 8.35A, 8.36, 8.47, 8.48 and on 8.49 is not applicable

CHAPTER - 9

PIPE CULVERTS

Preamble :

1. Pipe culverts of size 900mm, 1000mm and 1200mm dia in single row and double row which are generally used on roads, have been included. Only laying of pipe has been included in the rate. Auxiliary works such as excavation, backfilling, concrete and masonry shall be paid for separately provided under the respective clauses.
2. Backfilling upto 300 mm above top of the pipe shall be carefully done and the soil thoroughly rammed, tamped or vibrated in layers not exceeding 150 mm.
3. The height of filling above the top of pipe shall not be less than 600 mm.
4. Construction of pipe culvert using available pipes of 900 mm dia, 1000 mm dia & 1200 mm dia RCC Hume pipe is introduced in this chapter.
5. Corrossion resistant steel should be used at costal area belts (upto 25 km distance)
6. RCC mix design to be got approved with minimum cement constant mentioned in this is to be mantained.
7. If any of items from chapter 12, 13, 14, of catagory II are selected deduct 10% on basic rates.
8. Fine agregates used for the work is naturals and or double wased crushed metal sand.

CHAPTER-9

PIPE CULVERTS

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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9.01 408 **PCC 1:3:6 in Foundation [M 10]**

Providing and laying Plain cement concrete 1:3:6 mix with Granite / Basalt / Trap crushed stone aggregate 40 mm nominal size, clean sieved approved fine aggregate or dubble washed crushed metal sand mechanically mixed in concrete mixer, placed in foundation and compacted by vibrator, curing for 14 days, including cost of all materials, labour, hire charges of machinery, loading, unloading, lead, lift, transporting etc., complete.

Cum 4220.00

<i>Material Requirement:</i>	<i>Metal</i> 0.92 Cum	<i>Cement</i> 220 KG	<i>FA</i> 0.46 Cum
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9.02 2900 **I Laying Reinforced Cement Concrete Pipe NP4 / NP3 Prestressed Concrete Pipe on First Class Bedding in Single Row .**

Providing and Laying Reinforced cement concrete pipe NP4/NP3 prestressed concrete pipe for culverts on first class bedding of granular material in single row, fixing collar with clean sieved approved fine aggregate cement mortar 1:2, including curing cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

(i) **Using NP-4**

- A 900 mm dia
- B 1000 mm dia
- C 1200 mm dia

Rmtr 6390.00
Rmtr 7570.00
Rmtr 10240.00

(ii) **Using NP-3**

- A 900 mm dia
- B 1000 mm dia
- C 1200 mm dia

Rmtr 5310.00
Rmtr 6120.00
Rmtr 8240.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs.	Ps.
9.02	2900 Addl.	II Providing and Laying available prestressed Reinforced cement concrete pipe NP4/NP3, for culverts on first class bedding of granular material in single row, fixing collar with clean sieved approved fine aggregate or double washed crushed metal sand, cement mortar 1 :2, including cost of all materials, labour, loading, unloading, lead, lift, etc., complete			
	A	900 MM dia	Rmtr	672.00	
	B	1000 MM dia	Rmtr	700.00	
	C	1200 MM dia	Rmtr	910.00	
9.03	2900	I Laying Reinforced Cement Concrete Pipe NP4 / NP3 Prestressed Concrete Pipe on First Class Bedding in Double Row . Providing and Laying Reinforced cement concrete pipe NP4 / NP3 prestressed concrete pipe for culverts on first class bedding of granular material in double row including fixing collar with clean sieved approved fine aggregate cement mortar 1:2, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.			
	(i)	Using NP-4			
	A	900 mm dia	Rmtr	12860.00	
	B	1000 mm dia	Rmtr	15200.00	
	C	1200 mm dia	Rmtr	20550.00	
	(ii)	Using NP-3			
	A	900 mm dia	Rmtr	10700.00	
	B	1000 mm dia	Rmtr	12310.00	
	C	1200 mm dia	Rmtr	16560.00	
9.04	1500, 1700, 2100 & 2900	Providing & laying Plain / Reinforced Cement Concrete M 15 (1:2:4) in Open foundation using granite/trap/basalt aggregates of 20mm and downsize and clean sieved approved fine			

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

agrigate or duble washed crushed metal sand including mixing mechanically in Concrete Mixer laid in layers not exceeding 15cms thick layers, as per Drawing including cost of all materials, formwork, centring, vibrating, compacting, hire charges of machinery, lead, lift, loading, unloading, transporting, stacking, curing, finishing the exposed faces etc., complete. (excluding cost of steel and fabrication charges)

Cum 5055.00

<i>Material Requirement:</i>	<i>Cement</i> 275.33 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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9.05 1500, 1700, & 2200

Providing & laying **Plain / Reinforced Cement Concrete M 15** in **substructure / super structure** upto 5 mtrs. using granite/trap/basalt aggregates 20mm and downsize and clean sieved approved fine agrigate or duble washed crushed metal sand including mixing mechanically in Concrete Mixer laid in layers not exceeding 15cms thick layers, as per Drawing including cost of all materials, formwork, centring, vibrating, compacting, hire charges of machinery, lead, lift, loading, unloading, transporting, stacking, curing, finishing the exposed faces etc., complete.
(excluding cost of steel and fabrication charges)

Cum 5345.00

<i>Material Requirement:</i>	<i>Cement</i> 275.33 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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9.06 1500, 1700, & 2200

Providing & laying **Plain / Reinforced Cement Concrete M 20 [1:1½:3]** in **substructure** for **Abutment / Pier Cap** using granite/trap/basalt aggregates using 20mm and downsize and clean sieved approved fine agrigate or duble washed crushed metal sand including mixing mechanically in Concrete Mixer laid in layers not exceeding 15cms thick layers, as per Drawing including cost of all materials, formwork, centring, vibrating, compacting, hire charges of machinery, lead,

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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lift, loading, unloading, transporting, stacking, curing, finishing the exposed faces etc., complete (excluding cost of steel and fabrication charges)

Cum

5750.00

<i>Material Requirement:</i>	<i>Cement</i> 347.33 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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9.07 1500, 1700,
& 2300

Providing & laying **Reinforced Cement Concrete M 20 for solid slab superstructure** using granite / trap / basalt aggregates using 20mm and downsize and clean sieved approved fine aggregate or double washed crushed metal sand including mixing mechanically in Concrete Mixer laid in layers not exceeding 15cms thick layers, as per Drawing including cost of all materials, formwork, centring, vibrating, compacting, hire charges of machinery, lead, lift, loading, unloading, transporting, stacking, curing, finishing the exposed faces etc., complete. (excluding cost of steel and fabrication charges)

Cum

6230.00

<i>Material Requirement:</i>	<i>Cement</i> 346.82 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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9.08 1500, 1700,
& 2300

Providing & laying **Reinforced Cement Concrete M 25 for solid slab superstructure** using granite / trap / basalt aggregates using 20mm and downsize and clean sieved approved sand including mixing mechanically in Concrete Mixer laid in layers not exceeding 15cms thick layers, as per Drawing including cost of all materials, formwork, centring, vibrating, compacting, hire charges of machinery, lead, lift, loading, unloading, transporting, stacking, curing, finishing the exposed faces etc., complete. (excluding cost of steel and fabrication charges)

Cum

6645.00

<i>Material Requirement:</i>	<i>Cement</i> 399.33 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

9.09	1600	Providing T.M.T. Steel bar reinforcement conforming to IS-1786, designation as per table 1000-3 including straighten ing bars, cutting, bending, hooking, binding with approved quality binding wire after placing in position, tying, lapping and / or welding wherever required and anchoring to the adjoining members wherever necessary as per drawing (laps, hooks and wastages shall not be measured and paid) including cost of all materials, bar bending charges, labour, lifts etc., complete.			
		a) FE500 Grade	MT.	62000.00	
		b) FE550 Grade	MT.	62500.00	

<i>Material</i>	<i>TMT</i>	<i>Binding Wire</i>
<i>Requirement:</i>	<i>1050 Kg</i>	<i>6.00 Kg</i>

Note: Corrossion resistant steel shall be used at the coastal area belt (25km distance)

9.10	710.1.4.of IRC:78 & 2900	Back filling behind abutment, wing wall, return wall and foundation trenches as per drawing in layers not exceeding 20cms in depth, compacting deposited material by plate compactor/ power rammer after duly watering to achieve the desired degree of compaction, including cost of materials, labour, hire charge of machineries, transportation, lead, lift, loading, unloading etc complete.			
		A Granular material with all lead	Cum	675.00	
		B Sandy material with all lead	Cum	2810.00	
9.11	2503	Providing and laying boulders laid dry without wire crates for Apron on river bed for protection against scour with stone boulders weighing not less than 40 kg each complete as per drawing, including cost of all materials, labour, loading, unloading, lead and lift, transporting etc., complete.			
			Cum	1035.00	

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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9.12 2504 **PITCHING ON SLOPS**

Providing and laying **Pitching on Slopes** with backing laid over prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing, including cost of all materials, labour, loading, unloading, lead and lift, transporting etc., complete.

Cum 1035.00

Stone/Boulder

9.13 2505 Providing and laying **Rubble stone Flooring laid in cement mortar 1:3** with stone boulders weighing not less than 40 kg each and clean sieved approved sand mixing mechanically in Concrete Mixer as per drawing, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Cum 3390.00

<i>Material Requirement:</i>	<i>Cement 168.30 Kg</i>	<i>FA 0.346 Cum</i>	<i>Stone 1.20 Cum</i>
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9.14 2506 **Dry Rubble Flooring**

Construction of **dry rubble flooring** with backing at cross drainage works (for relatively less important works) as per drawing, including cost of all materials, labour, loading, unloading, lead and lift, transporting etc., complete.

Cum 1530.00

9.15 2605 (i) Providing and fixing in position 20 mm thick **Premoulded Joint Filler** in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant including cost & conveyance of all materials, labour, fixing in position, complete as per drawing.

Rmtr
per cm
height 6.85

(ii) Providing and **Filling Joint Sealing Compound** as per drawings with coarse sand and 6per cent

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		bitumen by weight (0.0168Kg/m Bitumen) including cost and conveyance of all materials, labour, lead and lifts, etc complete.	Rmtr	26.90

9.16 1400, 2100 A

For Foundation / Masonry Drain

Providing & constructing **Random Rubble Masonry (coursed)** using granite/trap/basalt stone hammer dressed, on all beds and joints except face and clean sieved approved fine aggregate or dubble washed crushed metal sand mixed in concrete mixer, in courses not less than 15 cms high, bond stones at 2 Mts apart in each course for foundation as per drawing including scaffolding, formwork, curing, cost of all materials, labour, hire charges of machinery, lead, lift, loading, unloading, transporting, stacking etc., complete.

(i) in C.M.1:3

Cum 4400.00

(ii) in C.M.1:6

Cum 4200.00

Material	Cement	FA	Stone
Requirement: 1:3	158.10KG	0.32Cum	1.257Cum
1:6	95.04KG	0.44Cum	1.257Cum

9.16 1400, 2100 B
& 2200**For Substruture**

Providing & constructing **Square Coursed Rubble Masonry (1st sort)** using granite/trap/basalt stone chisel dressed, on all beds and joints except face and clean sieved approved fine aggregate or dubble washed crushed metal sand mixed in concrete mixer, in courses not less than 15 cms high, bond stones at 2 Mts apart in each course for Substruture as per drawing including scaffolding, formwork, curing, cost of all materials, labour, hire charges of machinery, lead, lift, loading, unloading, transporting, stacking etc., complete.

(i) in C.M.1:3

Cum 4585.00

(ii) in C.M.1:6

Cum 4330.00

Material	Cement	FA	Stone
Requirement: 1:3	168.30KG	0.346Cum	1.157Cum
1:6	95.04KG	0.44Cum	1.157Cum

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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9.16 1400, 2200 C For Superstruture

Providing & constructing **Ashlar Masonry (1st sort)** using granite/trap/basalt stone chisel dressed, on all beds and joints except face and clean sieved approved fine agrigate or duble washed crushed metal sand mixed in concrete mixer, in courses not less than 15 cms high, bond stones at 2 Mts apart in each course for Superstruture as per drawing including scaffolding, formwork, curing, cost of all materials, labour, hire charges of machinery, lead, lift, loading, unloading, transporting, stacking etc., complete.

(i)	in C.M.1:3	Cum	6160.00
(ii)	in C.M.1:6	Cum	5900.00

Material	Cement	FA	Stone
Requirement: 1:3	168.30KG	0.34Cum	1.257Cum
1:6	95.04KG	0.44Cum	1.257Cum

9.17 1405.6

1312.3

Pointing in CM 1:3

Providing ruled pointing with C.M. 1:3 on **Stone Masonry** using clean sieved approved fine agrigate or duble washed crushed metal sand mixed in concrete mixer as per drawing 20mm deep after raking joints to a depth of 20mm, nicely lining to plumb and level including cost of all materials, labour, scaffolding, curing, transportation, loading, unloading, lead, lift, etc., complete.

Sqm 143.50

Material	Cement	FA
Requirement:	1.173KG	0.0024 Cum

9.18

Corrision inhbitant cement slurry on Reinforce bars:

Providing and applying 2 coats of corrision inhbitant cement slurry on reinforcement bars prepared by mixing of 1.686 KG of OPC cement with 670CC of inhabitator solution of approved quality by dipping

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

or brushing method, after cutting to required length and size, the first coat being applied after cleaning the bars by wire brush or alkaline cleaning powder to remove the rust and dust and allowed to air dry for 12-24 hours as the case may be and the second coat being applied on the fabricated bars before placing in position as per clause 5.3.3 of IS 9077-1979. the rate include cost of and conveyance of all materials, labour, charges, etc., complete as per direction of engineer in charge.

MT. 1700.00

Note: 1. Water should not be mixed with cement

Dowel bar insertion in well foundation / hard rock

9.19

- a) Providing and fixing 3m long 25mm dia TMT dowel bars 1.5m inserted in 38mm dia holes drilled in hard rock, grouting with epoxy. other end provided with L bend to embed in concrete, including necessary bending, hooking, cutting and handling charges, all labour, lead, lift, transportation, cost of all materials etc., complete. (MoRTH clause 1200).

Each 1515.00

- b) Providing and fixing 3m long 25mm dia TMT dowel bars 1.5m inserted in 38mm dia holes drilled in hard rock, grouting in CM 1:1. other end provided with L bend to embed in concrete, including necessary bending, hooking, cutting and handling charges, all labour, lead, lift, transportation, cost of all materials etc., complete. (MoRTH clause 1200).

Each 1170.00

9.20

Tar paper

Supplying, and fixing in position Tar paper over abutment as Bearing conforming to MoSRT & H Specifications as per drawing and Technical Specifications, including cost of all materials, labour, lead, lift, loading, unloading, transportation etc., complete.

Sqm 60.00

CHAPTER - 10

MAINTENANCE OF ROADS

Preamble :

- 1 In the case of rain cuts, it has been assumed that some material cut by rain, approximately 25 per cent, will be available at site which can be retrieved and revised and the balance 75 percent is required to be provided as fresh material.
- 2 For making up earthen shoulders, it has been assumed that on an average 150 mm filling will be required. Similarly, for stripping of excess soil from the shoulder, an average depth of 75 mm has been assumed.
- 3 In the case of chocking of drain, it has been assumed that half the depth of drain has been filled with earth/debris, which requires clearance.
- 4 During the process of landslide clearance on hill roads, it has been assumed that earth will be disposed off by the dozer on the valley side. In case there is any objection to this arrangement due to particular site conditions, resources like loader and tipper will have to be provided for disposal of earth/debris for the lead involved.
- 5 Pot-hole repair and patchwork are provided to be done by mechanical means.
- 6 Additional Items for pothole the repair and patching work are also proposed by using Cold Mix up to 40mm depth.

CHAPTER-10

MAINTENANCE OF ROADS

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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10.01 3002

Restoration of Rain Cuts

Restoration of rain cuts with soil, moorum, gravel or a mixture of these, clearing the loose soil, benching for 300 mm width, laying fresh material in layers not exceeding 250 mm and compacting with plate compactor or power rammers to restore the original alignment, levels and slopes including cost of all labour, hire charges of machinery, loading, unloading, lead upto 1Km, lift etc., complete.

Cum 123.00

Note Only 75 per cent of fresh material has been provided as 25 per cent can be retrieved at site from earth that is flown down the slope in the form of slurry and deposited at the foot of there in cuts

10.02 3003

Maintenance of Earthen Shoulder (filling with fresh soil)

Making up loss of material / irregularities on shoulder to the design level by adding fresh approved soil upto 150mm excavated by excavator, carriage by tipper and compacting it with plate compactor to the desired field density including cost of all materials, labour, hire charges of machinery, loading, unloading, lead upto 1km, lift etc., complete.

Sqm 30.90

10.03 3003

Maintenance of Earthen Shoulder (stripping excess soil)

Stripping excess soil from the shoulder surface upto 75mm to achieve the approved level and compacting with plate compactor, including cost of all labour, hire charges of machinery, loading, unloading, lead, lift, disposal of earth etc., complete.

Sqm 14.30

Note The earth slipped from earthen shoulders to be dumped on the side slopes locally for disposal.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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10.04 3004.2 Filling Pot-holes and Patch Repairs with open-Graded Premix surfacing, 20mm.

Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 511, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2, including cost of all materials, labour, hire charges of machinery, lead, lift, loading, unloading stacking, transporting etc., complete except lead for Bitumen & Emulsion.

A Using 60/70 grade Bitumen mixed in HMP **Sqm 122.00**

<i>Material</i>	<i>Metal</i>	<i>R S Emulsion</i>	<i>Bitumen 60/70 Gr</i>
<i>Requirement:</i>	<i>0.027 Cum</i>	<i>0.24 Kg</i>	<i>1.46 KG</i>

B Using Cationic Emulsion mixed in Concrete mixer **Sqm 160.00**

<i>Material</i>	<i>Metal</i>	<i>R S Emulsion</i>	<i>Cationic Emulsion</i>
<i>Requirement:</i>	<i>0.027 Cum</i>	<i>0.24 Kg</i>	<i>2.15 KG</i>

10.05 3004.2 Filling Pot-holes and Patch Repairs with Bituminous concrete, 40mm thick.

Removal of all failed material, trimming of completed excavation to provide firm vertical faces, cleaning of surface, painting of tack coat on the sides and base of excavation as per clause 503, back filling the pot holes with hot bituminous material as per clause 509, compacting, trimming and finishing the surface to form a smooth continuous surface, all as per clause 3004.2, including cost of all materials, labour, hire charges of machinery, lead, lift, loading,

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

unloading stacking, transporting etc., complete except lead for Bitumen & Emulsion.

(i) Using Grading I Material

Sqm 293.00

(ii) Using Grading II Material

Sqm 291.50

Material	Metal	R S Emulsion	Bitumen 60/70 Gr	Filler
Requirement:	0.057 Cum	0.24 Kg	4.59 Kg	1.75 Kg

10.06 3004.3.3

Crack Filling

Filling of crack using slow setting bitumen emulsion and applying crusher dust in case cracks are wider than 3mm, including cost of all materials, labour, lead, lift, loading, unloading, transporting etc., complete except lead for Emulsion.

Rmtr 5.95

10.07 3004.4

Dusting

Applying crusher dust to areas of road where bleeding of excess bitumen has occurred, including cost of all materials, labour, lead, lift, loading, unloading transporting, etc complete.

Sqm 1.90

10.09 3005.1

Repair of Joint Grooves with Epoxy Mortar

Repair of spalled joint grooves of contraction joints, longitudinal joints and expansion joints in concrete pavements using epoxy mortar or epoxy concrete, including cost of all labour, hire charges of machinery, loading, unloading, lead, lift etc., complete.

Rmtr 360.00

10.10 3005.2

Repair of old Joints Sealant

Removal of existing sealant and resealing of contraction, longitudinal or expansion joints in concrete pavement with fresh sealant material, including cost of all labour, hire

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		charges of machinery, loading, unloading, lead, lift etc., complete.	Rmtr	49.00
10.11	3000	Hill Side / Other Drain Clearance		
		Removal of earth from the choked hill side/other drain and disposing it on the valley side manually including cos. of labour, lead, lift etc., complete	Rmtr	53.00
10.12	3000	Land Slide Clearance in soil		
		Clearance of land slides in soil and ordinary rock by a bull-dozer and disposal of the same on the valley side, including cost of all labour, hire charges of machinery, loading, unloading, lead, lift etc., complete.	Cum	55.50
10.13	3000	Landslide Clearance in Hard Rock Requiring Blasting		
		Clearing of land slide in hard rock by a bull-dozer and air compressor requiring blasting for 50 per cent of the boulders and disposal of the same on the valley side, including cost of all labour, hire charges of machinery, loading, unloading, lead, lift etc., complete.	Cum	99.50
		Note Credit for the rock if found acceptable as construction material shall be deducted.		
10.14	Addl	Ready mix for patching of pot holes during rainy season		
		Providing / Supplying & placing of ready made cold bituminous mix to pot holes in accordance with IRC 116-2014, packed in 50Kg bags. The mix shall contain at least 5.6% of MC 800 cut back bitumen confirming to IS 217 specification with suitable anti-stripping agent. the mix shall be workable		

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

at least for 6 months. the material is intended to patching of pot holes, up to 40mm thick layers (the mix shall be manually laid and compacted by rammer (dipping in water) or plate compactor only) allow traffic spreading thin sand layer or placing some leaves on patch work, after compaction for avoiding loss of materials sticking to tyres.

Per 50kg Bag 350.00

Caution: Under any circumstances, MC 800 emulsion should NOT be added during aggregate drying operation, the readymix for bituminous pot hole filling material containing volatile kerosene may cause explosion when used near open flame.

10.15 Addl

Traffic Census

Providing temporary traffic census count post, on National Highways, counting manually, in three shifts, (24H, 7D) in both directions, with necessary literate assistants, and supporting labourer. (including updating the details as soft copy) Arrangements with cost of temporary tarpaulin shelter with top cover and three sides, of 3X5M size, one steel table, two plastic chairs, lighting arrangements, information banners, all arrangements to be made on previous day, and to be removed after completion of counting work, as per ministerial norms, guidelines, the direction and instructions of engineer in charge of work.

i) With tarpaulin shelter

1 day Both Directions 8000.00

ii) With water proof shelter

1 day Both Directions 8500.00

CHAPTER - 11

HORTICULTURE

Preamble :

- 1 Though the estimate for compensatory afforestation is made by the forest department, the rate for this item has been analysed and included for the purpose of estimation.

CHAPTER-11 HORTICULTURE

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
11.01	307	Spreading of Sludge Farm Yard Manure and good Earth Spreading of sludge farm yard manure and good earth in required thickness (cost of sludge, farm yard manure and good earth to be paid for separately) including cost of all labour, lead, lift etc., complete.	Cum	34.50
11.02	307	Grassing with 'Doobs' Grass Grassing with 'Doobs' grass including watering and maintenance of the lawn for 30 days or more till the grass forms a thick lawn free from weeds and fit for moving including supplying good earth if needed including cost of all labour, meterial, lead, lift, hire charges of machineries, transportaion etc., complete.		
	(i)	In rows 15 cm apart in either direction	Sqm	46.00
	(ii)	In rows 7.5 cm apart in either direction	Sqm	85.00
11.03	307	Making Lawns including Ploughing and Dragging with 'Swagha' Breaking of Clod Making lawns including ploughing and breaking of clod, removal of rubbish, dressing and supplying doobs grass roots and planting at 15 cm apart, including supplying and spreading of farm yard manure at the rate of 0.18 cum per 100 sqm including cost of all labour, meterial, lead, lift, hire charges of machineries, transportaion etc., complete.	Sqm	27.40
11.04	307	Maintenance of Lawns or Turfing of Slopes Maintenance of lawns or Turfing of slopes (rough grassing) for a period of one year including watering etc including cost of all labour, meterial, lead, lift, hire charges of machineries, transportaion etc., complete.	Sqm	106.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.
11.05	307	Turfing Lawns with Fine Grassing including Ploughing, Dressing Turfing lawns with fine grass including ploughing, dressing breaking of clods, removal of rubbish, dressing and supplying doobs grass roots at 10 cm apart, including supplying and spreading of farm yard manure at the rate of 0.6 cum per 100 sqm including cost of all labour, meterial, lead, lift, hire charges of machineries, transportaion etc complete.	Sqm	33.90	
11.06	307	Maintenance of Lawns with Fine Grassing for the First Year Maintenance of lawns with fine grassing for the first year including cost of all meterial, labour, lead, lift, watering, hire charges of machineries, transportaion etc., complete.	Sqm	92.50	
11.07	307	Planting and Maintaining of Permanent Hedges			
	(a)	Planting permanent hedges including digging of trenches Planting permanent hedges including digging of trenches, 60 cm wide and 45 cm deep, refilling the excavated earth mixed with farmyard manure, supplied at the rate of 4.65 cum per 100 metres and supplying and planting hedge plants at 30 cm apart including cost of all labour, meterial, lead and lift, hire charges of machineries, transportaion etc complete.	Rmtr	229.00	
	(b)	Maintenance of hedge for one year including watering, menure checks, pesticides, cost of all meterial, labour, lead, lift, hire charges of machineries, transportaion etc., complete.	Rmtr	203.00	
11.08	307	Planting and Maintaining of Flowering Plants and Shrubs			
	(a)	Planting and Maintaining of flowering plants and shrubs in central verge including watering, spreading manure, spraying pesticides, cost of all material, labour, lead, lift, hire charges of machineries, transportaion etc., complete.	KM	66000.00	

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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Note: Running metres 200 plants and 800 shrubs in two rows in one km length of road where width of verge is 3m and above.

- (b) Maintenance of flowering plants and shrubs in central verge for one year including watering, spreading manure, pesticide treatment, replacing damaged plant shrubs, including cost of all labour, material, lead, lift, hire charges of machineries, transportaion etc., complete.

KM 221000.00

11.09 307

Planting of Trees and its Maintenance for one Year

Planting of trees by the road side (Avenue trees) in 0.60 m dia holes, 1 m deep dug in the ground, mixing the soil with decayed farm yard/sludge manure, planting the saplings, backfilling the trench, watering, fixing the tree guard and maintaining the plants for one year including watering, spreading manure, pesticide treatment, replacing damaged plant shrubs etc complete including cost of all labour, material, lead, lift, hire charges of machineries, transportaion etc., complete.

Each 1070.00

11.10 308

Renovation Lawns including, Weeding, Forking the Ground, Top Dressing with Forked Soil

Renovation lawns including, weeding, forking the ground, top dressing with forked soil, watering and maintenance the lawns, for 30 days or more, till the grass forms a thick lawn, free from weeds, and fit for moving and disposal of rubbish as directed, including supplying good earth, if needed but excluding the cost of well decayed farm yard manure including cost of all labour, material, lead, lift, hire charges of machineries, transportaion etc., complete.

Sqm 17.35

11.11 308.2

Supply at Site Well Decayed Farm Yard Manure

Supply at site of work well decayed farm yard manure, from any available source, approved by the engineer in charge including screening and stacking including cost of all labour, material, lead, lift, hire charges of machineries, transportaion etc., complete.

Cum 205.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
11.14	New	Half Brick Circular Tree Guard, in 2nd Class Brick, internal diameter 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground Half brick circular tree guard, in 2nd class brick, internal diameter 1.25 metres, and height 1.2 metres, above ground and 0.20 metre below ground, bottom two courses laid dry, and top three courses in cement mortar 1:6 and the intermediate courses being in dry honey comb masonry, as per design, including cost of all labour, material, lead, lift, hire charges of machineries, transportaion etc., complete.	Each	2290.00
11.15	New	Edging with 2nd Class Bricks, Laid Dry Lengthwise Edging with 2nd class bricks, laid dry lengthwise, including excavation, refilling, consolidation, with hand packing and spreading nearly surplus earth within a lead of 50 metres, including cost of all labour, material, lead, lift, hire charges of machineries, transportaion etc., complete.	Rmtr	46.20
11.16	New	Making Tree Guard 53 cm dia and 1.3 m High as per Design from Empty Bitumen Drums Making tree guard 53 cm dia and 1.3 m high as per design from empty bitumen drum, slit suitably to permit sun and air, including providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets, complete in all respect, including cost of all labour, material, lead, lift, hire charges of machineries, transportaion etc., complete.	Each	352.00
11.17	New	Making Tree Guard 53 cm dia and 2 Metre High as per Design from Empty Bitumen Drums Making tree guard 53 cm dia and 2 metres high as per design from empty bitumen drums, slit suitably to permit sun and air, including		

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		providing and fixing four legs 40 cm long of 30 x 3 mm MS riveted to tree guard and providing and fixing 2 nos MS sheet rings 50 x 0.5 mm with rivets complete in all respects, including cost of all labour, material, lead, lift, hire charges of machineries, transportaion etc., complete.	Each	670.00
11.18	New	Wrought Iron and Mild Steel Welded Work Wrought iron and mild steel welded work (using angles, square bars, tees and channel grills, grating frames, gates and tree guards of any size and design etc. including cost of screens and welding rods or bolts and nuts complete fixed in position but without the cost of excavation and concrete for fixing, including cost of all labour, material, lead, lift, hire charges of machineries, transportaion etc., complete.	Quintal	7430.00
11.19	New	Tree Guard with MS Iron Providing and fixing MS iron tree guard 60 cm dia and 2 metre high above ground level formed of 4 Nos (25 x 6 mm) and 8 Nos (25 x 3 mm) vertical MS riveted to 3 Nos (25 x 6 mm) iron rings in two halves, bolted together with 8 mm dia and 30 mm long bolts including painting two coats with paint of approved brand over a coat of priming, complete in all respects including cost of all labour, material, lead, lift, hire charges of machineries, transportaion etc., complete.	Each	1720.00
	Note	The items of excavation and concreting to be measured and paid separately as per design .		
11.20	New	Tree Guard with MS Angle Iron and Steel Wire Providing and fixing tree guard 0.60 metre square, 2.00 metre high fabricated with MS angle iron 30 x 30 x 3 mm, MS iron 25 x 3 mm and steel wire 3 mm dia welded and fabricated as per design in two halves bolted together including cost of all labour, material, lead, lift, hire charges of machineries, transportaion etc., complete.	Each	2280.00

PART - 'B'

BRIDGE WORKS

CHAPTER - 12

FOUNDATION

Preamble :

1. Excavation for structures has been provided both by manual and mechanical means. The rate relevant to a particular situation may be adopted.
2. The earth excavated from foundation has been proposed to be backfilled and balance quantity utilized for road work locally except for marshy soil where disposal has been provided.
3. In case of rocks, excavation has been considered upto a depth of 3 m only.
4. Dewatering has been provided in excavation for foundation by mechanical means only. In case dewatering is not required for a particular site condition, the same may be omitted.
5. Mixing of cement concrete has been considered both by using Concrete mixer and batching plant. The rate can be adopted depending upon availability of equipment and as approved by the Engineer.
6. Concrete Batching Plant is generally placed within one km of the bridge site. In case of longer lead, transportation cost may be worked out based on Tonne - Km / Cum - Km.
7. The coarse and fine aggregate for cement concrete shall be as per IS:383.
8. Description of items has been given very briefly. Relevant clauses of MoSRT&H Specifications may be referred for detailed specification.
9. Pneumatic sinking is a specialised job. All safety precaution as per IS:4138 are required to be taken. Medical supervision for such works is considered very essential. Depth of pneumatic sinking has been restricted to 30 m below normal water level.
- 10 While Calculating the rates in Sl. No. 12.12 to 12.19 (Sinking of wells) the amount should be rounded down to previous One Rupee of the Calculation for the next depth.
11. The levelling course below the pile cap is proposed with M-15 grade concrete.
12. Steel reinforcement for cement concrete works are required to be provided separately. The rate for the same has been analysed.

13. Appendix-4 of IRC: 78-2000 may be referred regarding precautions to be taken during sinking of wells.
14. Necessary safety precautions shall be taken for excavation on open foundations for which guidance may be taken from IS: 3764.
15. A levelling course of 100 mm thickness in M-10 (1 :3:6) shall be provided before laying open foundations.
16. In the case of open foundation, dewatering shall not be permitted from the time of placing of concrete upto 24 hours after placement.
17. In case of open foundations in rock, the trenches around the footing shall be filled-up with concrete of M-15 grade upto a level of 0.6 m for hard rock and 1.5 m for soft rock above the foundation level. The portion above this may be filled by boulders grouted with cement.
18. The well curb shall be in RCC of mix not leaner than M-25 grade with minimum steel reinforcement of 72 kg/cum excluding bond rods.
19. The top of the bottom plug shall be atleast 300 mm above top of curb.
20. No dewatering shall be carried out within 7 days of casting of bottom plug.
21. In case of cement concrete piles, the minimum grade of concrete shall be M-35 with minimum cement content of 400 kg/cum.
22. The top of the pile shall project 50 mm into the pile cap and reinforcement of pile shall be fully anchored in pile cap.
23. The minimum thickness of pile cap should be at least 0.6 m or 1.5 times the diameter of the pile whichever is more.
24. Guidance for piles is to be obtained from IS:2911.
25. Concrete in driven cast-in-situ piles shall be cast upto a minimum height of 600 mm above the designed top level of pile, which shall be stripped off to obtain sound concrete either before final set or after 3 days.
26. (a) For major bridge (category-I) all concrete shall be design mix only.
(b) For minor bridge (category-II) and culverts nominal mix is permitted upto M-20 concrete as per clause 1703.3.
27. Corrossion resistant steel should be used at costal area belts (upto 25 km distance)
28. RCC mix design to be got approved with minimum cement constant mention in chapter 12, 13, 14 are to be maintained.

CHAPTER-12

FOUNDATION

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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12.01 304

Excavation for Structures

Earth work excavation for foundation structures as per drawing and technical specification, including setting out, removal of stumps and other deleterious matter, dressing of sides and bottom, backfilling with approved excavated materials to the extent required and utilizing the remaining earth locally for road work. Including labour disposal of un servisable excavated stuff within 100mtrs radius etc. complete with all lead, lifts, loading unloading for the successful completion of work.

I Ordinary soil

A Manual Means

(i)	Depth upto 3 m	Cum	205.00	195.00
(ii)	Depth 3 m to 6 m	Cum	260.00	250.00
(iii)	Depth above 6 m	Cum	350.00	330.00

B Mechanical Means using hydraulic excavator

(i)	Depth upto 3 m	Cum	52.55	50.45
(ii)	Depth 3 m to 6 m	Cum	60.00	57.60
(iii)	Depth above 6m	Cum	76.00	73.00

II Ordinary Rock (not requiring blasting)

A Manual Means

(i)	Depth upto 3 m	Cum	290.00	280.00
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B	<u>Mechanical Means using hydraulic excavator</u>	Cum	63.00	60.00
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Note 1. In case of rock, foundation beyond 3 m is not dug and hence not included.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
III		Hard Rock (requiring blasting)	Cum	619.00	594.00
	A	Manual Means			
IV		Hard Rock (blasing prohibited)	Cum	496.00	476.00
	A	<u>Mechanical Means using Air compressor</u>			
V		Marshy Soil			
		Depth upto 3 m			
	A	Excavation by Manual means and disposal upto 1 km by mechanical means	Cum	685.00	655.00
	B	Excavation and disposal upto 1 km by mechanical means using hydraulic excavator.	Cum	150.00	145.00
<p>Note 1. Cost of dewatering @ Rs. 30.00 for Cat-I & Rs. 30.00 for Cat-II/Cum as per site conditions.</p> <p>2. Shoring & strutting @ Rs. 15.00 for Cat-I & Rs. 15.00 for Cat-II/Cum where ever required may be added.</p>					
VI		Back Filling in Marshy Foundation Pits using approved earth excavated by Manual means	Cum	410.00	400.00
12.02	304	Filling Annular Space Around Footing in Rock			
		Providing & laying Lean Cement Concrete 1:3:6 nominal mix proportion for filling annular space around footing in rock using granite/trap/basalt stone aggregate of 40mm & down size & clean sieved approved fine aggregate or duple washed crushed metal sand in foundation including mixing mechanically, laid in layers not exceeding 15cms thick layers & vibrating with needle vibrator including curing, cost of all materials, labour, hire charges of machinery lead, lift, loading, unloading stacking charges, finishing the exposed faces etc., complete	Cum	4800.00	4610.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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<i>Material Requirement:</i>	<i>Cement</i> 230.00 Kg	<i>FA</i> 0.45 cum	<i>Metal</i> 0.90 Cum		
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12.03 304

Providing & Filing in **foundation trenches** and at the back of abutments, wing walls & below pipe beds etc., in layers not exceeding 15 cm thick using approved quality **coarse Sand** including watering, compacting with plate compactor, cost of all materials, labour, lead, lifts, loading, unloading, stacking etc., complete.

Cum 2940.00 2830.00

<i>Material Requirement:</i>	<i>FA</i> 1.20 cum
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12.04 2100

PCC 1:3:6 in Foundation

Providing & laying **Plain Cement Concrete 1:3:6** nominal mix **for foundation** using granite / trap / basalt stone aggregates **40mm** and down size and clean sieved approved fine aggregate or duple washed crushed metal sand in foundation including mixing mechanically, laid in layers not exceeding 15cms thick, vibrating, compacting including formwork, centring, cost of all materials, labour, hire charges of machinery, lead, lift, loading unloading, stacking charges, curing, finishing the exposed faces in CM 1:4 etc., complete.

Cum 4800.00 4610.00

<i>Material Requirement:</i>	<i>Cement</i> 230.00 Kg	<i>FA</i> 0.45 cum	<i>Metal</i> 0.90 Cum
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12.05 1300

Providing and constructing **Burnt Brick Masonry** with approved quality of non modular bricks of standard size of 1st Class standard designation with **Cement Mortar 1:3 in foundation** as per Drawing using clean sieved approved fine aggregate or duple washed crushed metal sand mixed in concrete mixer, scaffolding, formwork, curing, including cost of all materials, labour, hire charges of machinery, lead, lift,

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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loading, unloading, transporting, stacking etc., complete. (excluding Pointing and Plastering)

Cum 7640.00 7335.00

Material Requirement:	Cement 122.40 Kg	FA 0.25 cum	Brick 500 Nos
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12.07 1400

Providing & constructing granite/trap/basalt rubble masonry in C.M.1:3 for foundation as per drawing using clean sieved approved fine aggregate or duple washed crushed metal sand mixed in concrete mixer in courses not less than 15 cms high, bond stones at 2 Mts apart in each course as per Drawing including scaffolding, formwork, curing, cost of all materials, labour, hire charges of machinery, lead, lift, loading, unloading, transporting, stacking etc., complete.

1405.4 A Square Rubble Coursed Rubble Masonry (first sort) using stone chisel dressed, on all beds and joints except face

Cum 5565.00 5345.00

Material Requirement:	Cement 153.00 Kg	FA 0.315 Cum	Stone 1.257 Cum
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1405.3 B Random Rubble Masonry (coursed) using stone hammer dressed, on all beds and joints except face

Cum 5290.00 5080.00

Material Requirement:	Cement 158.00 Kg	FA 0.32 Cum	Stone 1.257 Cum
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12.08 2100

Providing & laying Plain / Reinforced Cement Concrete in Open foundation using granite/trap/basalt aggregates and clean sieved approved fine aggregate or duple washed crushed metal sand including mixing mechanically, laid in layers not exceeding 15cms thick layers, as

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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per Drawing including cost of all materials, formwork, centring, vibrating, compacting, hire charges of machinery, lead, lift, loading, unloading, transporting, stacking, curing, finishing the exposed faces etc., complete. (excluding cost of steel and fabrication charges)

(i) Using Concrete Mixer

A PCC M15 using 40mm and downsize Cum 5570.00 5350.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	275.33 Kg	0.45 Cum	0.90 Cum

B PCC M20 using 40mm and downsize metal Cum 6070.00 5830.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	344.00 Kg	0.45 Cum	0.90 Cum

C RCC M20 using 20mm and downsize metal Cum 6170.00 5930.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	347.33 Kg	0.45 Cum	0.90 Cum

D PCC M25 using 40mm and downsize metal Cum 6450.00 6190.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	399.33 Kg	0.45 Cum	0.90 Cum

E RCC M25 using 20mm and downsize metal Cum 6550.00 6290.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	403.33 Kg	0.45 Cum	0.90 Cum

F PCC M30 using 40mm and downsize metal Cum 6470.00 5210.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	405.33 Kg	0.45 Cum	0.90 Cum

G RCC M30 using 20mm and downsize metal Cum 6560.00 6300.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	406.67 Kg	0.45 Cum	0.90 Cum

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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H RCC M35 using 20mm and downsize metal Cum 6630.00 6370.00

Material Requirement:	Cement 422.00 Kg	FA 0.45 Cum	Metal 0.90 Cum
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12.08 2100

Providing & laying **Plan / Reinforced Cement Concrete** in **Open foundation** using granite/trap/basalt aggregates and clean sieved approved fine aggregate or double washed crushed metal sand including mixing mechanically, laid in layers not exceeding 15cms thick as per Drawing including cost of all materials, formwork, centring, vibrating, compacting, hire charges of machinery, all lead and lift, loading, unloading, transporting, stacking, curing, finishing the exposed faces etc., complete with lead of concrete mix upto 1 km. (excluding cost of steel and fabrication charges)

(ii) Using Batching Plant, Transit Mixer and Concrete Pump

C RCC M20 using 20mm and downsize metal Cum 5470.00 5250.00

Material Requirement:	Cement 347.17 Kg	FA 0.45 Cum	Metal 0.90 Cum
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D PCC M25 using 40mm and downsize metal Cum 5750.00 5520.00

Material Requirement:	Cement 399.58 Kg	FA 0.45 Cum	Metal 0.90 Cum
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E RCC M25 using 20mm and downsize metal Cum 5850.00 5620.00

Material Requirement:	Cement 403.17 Kg	FA 0.45 Cum	Metal 0.90 Cum
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F PCC M30 using 40mm and downsize metal Cum 5780.00 5540.00

Material Requirement:	Cement 405.00Kg	FA 0.45 Cum	Metal 0.90 Cum
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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G RCC M30 using 20mm and downsize metal Cum 6860.00 5630.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	406.67 Kg	0.45 Cum	0.90 Cum

H RCC M35 using 20mm and downsize metal Cum 5940.00 5700.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	422.00 Kg	0.45 Cum	0.90 Cum

WELL FOUNDATION

12.09 1200

Providing and Constructing **Temporary Island 16 m diameter for Construction of Well Foundation 8m dia. Well** by using crane with grab, compacting earth, placing fine aggregate or double washed crushed metal sand bags for protection of earth on slopes including cost of all materials, hire charge of machineries, labour, lead, lift, loading, unloading etc., complete The diameter of the island shall be in the conformity with clause 1203.2.

A For Depth of water 1.0 m and height of island 1.25 m.

No. 130800.00 125600.00

<i>Material</i>	<i>Earth Compacted</i>	<i>Sand Bags</i>
<i>Requirement:</i>	251.20 Cum	750 Nos

B For Depth of water 4.0 m and height of island 4.5 m.

No. 772000.00 741000.00

<i>Material</i>	<i>Earth Compacted</i>	<i>Sand Bags</i>
<i>Requirement:</i>	904.32 Cum	6000 Nos

C Providing and constructing one span service road to reach island location from one pier location to another pier location of span length 30mtrs, width of service road 10mtr. depth of water 1 mtrs. and height of road 1.25 mtrs. using Front end loader, transporting the materials by tipper, compacting earth, placing

Sl. No.	Ref. to MoSRT & H Specification	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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H RCC M35

Material Requirement:

12.08 2100

Prov
Cen

Cum 5940.00 5700.00
Cum 6860.00 5630.00

5230.00 5020.00

for

8 mtr

at & 100 x

anchor bars of

g including cutting,

les, joining, welding,

ation including cost of all

our, lead, lift loading, unloading,

ang, hire charge of machineries etc.,

plete.

M.T. 80500.00 77200.00

at	Structural steel	Nut & Bolts
uirement:	1050 Kgs	20 Kgs

1200, 1500
& 1700

Providing & laying **Plain / Reinforced Cement Concrete** in **Well foundation** using granite/trap/basalt aggregates and clean sieved approved fine aggregate or dubble washed crushed metal sand including mixing mechanically, laid in layers not exceeding 15cms thick as per Drawing including cost of all materials, formwork, centring, vibrating, compacting, hire charges of machinery, lead, lift, loading, unloading, transporting, stacking, curing, finishing the exposed faces etc., complete. (excluding cost of steel and fabrication charges)

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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12.11 A Well Curb

(a) Using Concrete Mixer

(i) RCC M20 using 20mm and downsize metal Cum 7120.00 6840.00

Material Requirement:	Cement 347.33 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(ii) RCC M25 using 20mm and downsize metal Cum 7580.00 7280.00

Material Requirement:	Cement 403.33 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(iii) RCC M35 using 20mm and downsize metal Cum 7730.00 7420.00

Material Requirement:	Cement 422.00 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(b) Using Batching Plant, Transit Mixer and Concrete Pump with lead for mix upto 1 km.

(i) RCC M20 using 20mm and downsize metal Cum 6320.00 6060.00

Material Requirement:	Cement 347.17 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(ii) RCC M25 using 20mm and downsize metal Cum 6770.00 6500.00

Material Requirement:	Cement 403.17 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(iii) RCC M35 using 20mm and downsize metal Cum 7090.00 6810.00

Material Requirement:	Cement 422.00 Kg	FA 0.45 Cum	Metal 0.90 Cum
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Note: If curb concrete is carried out within steel liner, cost of formwork shall be excluded.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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12.11 B

Well Steining

(a) Using Concrete Mixer

(i) PCC M15 using 40mm and downsize metal Cum 5890.00 5600.00

Material	Cement	FA	Metal
Requirement:	275.33 Kg	0.45 Cum	0.90 Cum

(ii) PCC M20 using 40mm and downsize metal Cum 6420.00 6170.00

Material	Cement	FA	Metal
Requirement:	344.00 Kg	0.45 Cum	0.90 Cum

(iii) RCC M20 using 20mm and downsize metal Cum 6530.00 6270.00

Material	Cement	FA	Metal
Requirement:	347.33 Kg	0.45 Cum	0.90 Cum

(iv) PCC M25 using 40mm and downsize metal Cum 6840.00 5650.00

Material	Cement	FA	Metal
Requirement:	399.33 Kg	0.45 Cum	0.90 Cum

(v) RCC M25 using 20mm and downsize metal Cum 6950.00 6670.00

Material	Cement	FA	Metal
Requirement:	403.33 Kg	0.45 Cum	0.90 Cum

(vi) PCC M30 using 40mm and downsize metal Cum 6880.00 6610.00

Material	Cement	FA	Metal
Requirement:	405.33 Kg	0.45 Cum	0.90 Cum

(vii) RCC M30 using 20mm and downsize metal Cum 6970.00 6690.00

Material	Cement	FA	Metal
Requirement:	406.67 Kg	0.45 Cum	0.90 Cum

(viii) RCC M35 using 20mm and downsize metal Cum 7090.00 6800.00

Material	Cement	FA	Metal
Requirement:	422.00 Kg	0.45 Cum	0.90 Cum

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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12.11 B Well Steining(b) Using Batching Plant, Transit Mixer and Concrete Pump with lead upto 1 km.

(iii) RCC M20 using 20mm and downsize metal Cum 5790.00 5560.00

<i>Material Requirement:</i>	<i>Cement</i> 347.17 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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(iv) PCC M25 using 40mm and downsize metal Cum 6100.00 5850.00

<i>Material Requirement:</i>	<i>Cement</i> 399.58 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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(v) RCC M25 using 20mm and downsize metal Cum 6210.00 5960.00

<i>Material Requirement:</i>	<i>Cement</i> 403.17 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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(vi) PCC M30 using 40mm and downsize metal Cum 6140.00 5890.00

<i>Material Requirement:</i>	<i>Cement</i> 405.00 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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(vii) RCC M30 using 20mm and downsize metal Cum 6230.00 5980.00

<i>Material Requirement:</i>	<i>Cement</i> 406.67 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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(viii) RCC M35 using 20mm and downsize metal Cum 6500.00 6240.00

<i>Material Requirement:</i>	<i>Cement</i> 422.00 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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(ix) RCC M40 using 20mm and downsize metal Cum 6560.00 6300.00

<i>Material Requirement:</i>	<i>Cement</i> 430.00 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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12.11 C

Bottom Plug**(a) Using Concrete Mixer**

Note: 1. Concrete to be placed using tremie pipe
2. 10% extra cement to be added where under water concreting is involved

(i) PCC M20 using 40mm and downsize metal Cum 6350.00 6100.00

<i>Material Requirement:</i>	<i>Cement</i> 370.00 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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(ii) PCC M25 using 40mm and downsize metal Cum 6760.00 6490.00

<i>Material Requirement:</i>	<i>Cement</i> 399.33 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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(iii) PCC M30 using 40mm and downsize metal Cum 6810.00 6530.00

<i>Material Requirement:</i>	<i>Cement</i> 405.33 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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(iv) PCC M35 using 40mm and downsize metal Cum 6910.00 6630.00

<i>Material Requirement:</i>	<i>Cement</i> 419.33 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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12.11 C

(b) Using Batching Plant, Transit Mixer and Concrete Pump with lead for mix upto 1 km.

(i) PCC M20 using 20mm and downsize metal Cum 5590.00 5370.00

<i>Material Requirement:</i>	<i>Cement</i> 370.00 Kg	<i>FA</i> 0.45 Cum	<i>Metal</i> 0.90 Cum
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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(ii) PCC M25 using 20mm and downsize metal Cum 6000.00 5760.00

Material Requirement:	Cement 399.00 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(iii) PCC M30 using 20mm and downsize metal Cum 6050.00 5810.00

Material Requirement:	Cement 405.33Kg	FA 0.45 Cum	Metal 0.90 Cum
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(iv) PCC M35 using 20mm and downsize metal Cum 6140.00 5900.00

Material Requirement:	Cement 419.00Kg	FA 0.45 Cum	Metal 0.90 Cum
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12.11 D

Intermediate Plug

(a) Using Concrete Mixer

(i) PCC M20 using 40mm and downsize metal Cum 6070.00 5830.00

Material Requirement:	Cement 344.00 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(ii) PCC M25 using 40mm and downsize metal Cum 6460.00 6200.00

Material Requirement:	Cement 399.33 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(iii) PCC M30 using 40mm and downsize metal Cum 6500.00 6240.00

Material Requirement:	Cement 405.33 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(b) Using Batching Plant, Transit Mixer and Concrete Pump with lead for mix upto 1 km.

(i) PCC M20 using 20mm and downsize metal Cum 5360.00 5150.00

Material Requirement:	Cement 344.00 Kg	FA 0.45 Cum	Metal 0.90 Cum
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Sl. No.	Ref. to MoSRT & H Specification	Description Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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(ii) PCC M25 using 20mm and downsize metal Cum 5730.00 5500.00

Material Requirement:	Cement 399.00 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(iii) PCC M30 using 20mm and downsize metal Cum 5770.00 5540.00

Material Requirement:	Cement 405.33 Kg	FA 0.45 Cum	Metal 0.90 Cum
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12.11 E

Top Plug

(a) Using Concrete Mixer

(i) PCC M15 using 40mm and downsize metal Cum 5360.00 5140.00

Material Requirement:	Cement 275.33 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(ii) PCC M20 using 40mm and downsize metal Cum 5840.00 5610.00

Material Requirement:	Cement 344.00 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(iii) PCC M25 using 40mm and downsize metal Cum 6210.00 5970.00

Material Requirement:	Cement 399.33 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(iv) PCC M30 using 40mm and downsize metal Cum 6260.00 6000.00

Material Requirement:	Cement 405.33 Kg	FA 0.45 Cum	Metal 0.90 Cum
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(b) Using Batching Plant, Transit Mixer and Concrete Pump with lead for mix upto 1 km.

(i) PCC M25 using 40mm and downsize metal Cum 5540.00 5320.00

Material Requirement:	Cement 399.58 Kg	FA 0.45 Cum	Metal 0.90 Cum
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Sl. No.	Ref. to MoSRT & H Specification	Description Unit		Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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(ii) PCC M30 using 40mm and downsize metal Cum 5580.00 5360.00

Material	Cement	FA	Metal
Requirement:	405.00 Kg	0.45 Cum	0.90 Cum

12.11 F

Well Cap

(a) Using Concrete Mixer

(i) RCC M20 using 20mm and downsize metal Cum 6130.00 5890.00

Material	Cement	FA	Metal
Requirement:	341.33 Kg	0.45 Cum	0.90 Cum

(ii) RCC M25 using 20mm and downsize metal Cum 6550.00 6290.00

Material	Cement	FA	Metal
Requirement:	403.33 Kg	0.45 Cum	0.90 Cum

(iii) RCC M30 using 20mm and downsize metal Cum 6560.00 6300.00

Material	Cement	FA	Metal
Requirement:	406.67 Kg	0.45 Cum	0.90 Cum

(iv) RCC M35 using 20mm and downsize metal Cum 6630.00 6370.00

Material	Cement	FA	Metal
Requirement:	422.00 Kg	0.45 Cum	0.90 Cum

(b) Using Batching Plant, Transit Mixer and Concrete Pump with lead for mix upto 1 km.

(i) RCC M20 using 20mm and downsize metal Cum 5430.00 5210.00

Material	Cement	FA	Metal
Requirement	347.17 Kg	0.45 Cum	0.90 Cum

(ii) RCC M25 using 20mm and downsize metal Cum 5850.00 5620.00

Material	Cement	FA	Metal
Requirement	403.33 Kg	0.45 Cum	0.90 Cum

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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(iii) RCC M30 using 20mm and downsize metal Cum 5860.00 5630.00

Material	Cement	FA	Metal
Requirement:	406.58 Kg	0.45 Cum	0.90 Cum

(iv) RCC M35 using 20mm and downsize metal Cum 5940.00 5700.00

Material	Cement	FA	Metal
Requirement:	422.00 Kg	0.45 Cum	0.90 Cum

(v) RCC M40 using 20mm and downsize metal Cum 6180.00 5930.00

Material	Cement	FA	Metal
Requirement:	435.00 Kg	0.45 Cum	0.90 Cum

12.12 1200

Providing & Sinking of 6 m external diameter well (other than pneumatic method of sinking) as per drawing. Depth of sinking is reckoned from bed level using machinery, crane with grab bucket with safety precautions including cost of all materials, hire charge of machineries, labour, lead, lift, loading, unloading etc., complete including Kentledge supports loading arrangements and dewatering wherever necessary.

A Sandy Soil

(i) Depth below bed level upto 3.0 M Rmtr 5970.00 5730.00

(ii) Beyond 3m upto 10m depth Rmtr 8500.00 8160.00

(iii) Beyond 10m upto 20m

a Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter i.e, 10 mtr @ Rs.8500.00 for Category-I / Rmtr. & Rs. 8160.00 for Category-II / Rmtr.

(iv) Beyond 20m upto 30 m

a Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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meter i.e, 20 mtr @ Rs.13840.00 for Category-I / Rmtr. & Rs. 13285.00 for Category-II / Rmtr.

- b Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour @ Rs.14878.00 for Category-I / Rmtr. & Rs. 14281.00 for Category-II / Rmtr.

(v) Beyond 30m upto 40 m

- a Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter @ Rs.28518.00 for Category-I / Rmtr. & Rs. 27374.00 for Category-II / Rmtr.
- b Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour @ Rs.31369.00 for Category-I / Rmtr. & Rs. 30111.00 for Category-II / Rmtr.

B Clayey Soil (6m dia. Well)

- (i) Depth below bed level upto 3.0 M Rmtr 8500.00 8160.00
- (ii) Beyond 3m upto 10m depth Rmtr 17740.00 17030.00
- (iii) Beyond 10 m upto 20 m
- a Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th Mtr @ Rs.17740.00 for Category-I / Rmtr. & Rs. 17030.00 for Category-II / Rmtr.
- b Add for dewatering @ 5 per cent of cost, if required 11th Mtr @ Rs.18627.00 for Category-I / Rmtr. & Rs. 17881.00 for Category-II / Rmtr.
- (iv) Beyond 20m upto 30 m
- a Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th Mtr @ Rs.28890.00 for Category-I / Rmtr. & Rs. 27732.00 for Category-II / Rmtr.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
		b Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour). 21st Mtr @ Rs.31056.00 for Category-I / Rmtr. & Rs. 29811.00 for Category-II / Rmtr.			
		c Add 5 per cent of cost for dewatering of the cost, if required 21st Mtr@ Rs.38820.00 for Category-I / Rmtr. & Rs. 37263.00 for Category-II / Rmtr.			
		(v) Beyond 30m upto 40 m			
		a Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th Mtr@ Rs.59535.00 for Category-I / Rmtr. & Rs. 57148.00 for Category-II / Rmtr.			
		b Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour). 31st Mtr@ Rs.65488.00 for Category-I/ Rmtr.& Rs. 62862.00 for Category-II / Rmtr.			
		c Add 5 per cent of cost for dewatering, if required over 31st Mtr@ Rs.78585.00 for Category-I / Rmtr. & Rs. 75434.00 for Category-II / Rmtr.			
C		Soft Rock (in soft rock strata depth upto 3m)	Rmtr	18090.00	17370.00
D		Hard Rock (in hard rock strata depth upto 3m)	Rmtr	26560.00	25490.00
12.13	1200	Providing & Sinking of 7 m external diameter well (other than pneumatic method of sinking) as per drawing. Depth of sinking is reckoned from bed level. Using machinery, crane with grab bucket with safety precautions including cost of all materials, hire charge of machineries, labour, lead, lift, loading, unloading etc., complete including Kentledge supports loading arrangements and dewatering wherever necessary			
A		Sandy Soil			
		(i) Depth below bed level upto 3.0 M		Rmtr 9020.00	8660.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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(ii) Beyond 3m upto 10m depth Rmtr 12070.00 11580.00

(iii) Beyond 10m upto 20m

a Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10 th Mtr @ Rs.12070.00 for Category-I / Rmtr & Rs. 11580.00 for Category-II / Rmtr

(iv) Beyond 20m upto 30 m

a Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.19656.00 for Category-I / Rmtr & Rs. 18856.00 for Category-II / Rmtr

b Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour) @ Rs.21130.00 for Category-I / Rmtr & Rs. 20270.00 for Category-II / Rmtr

(v) Beyond 30m upto 40 m

a Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.40504.00 for Category-I / Rmtr & Rs. 38858.00 for Category-II / Rmtr

b Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc. over 31st @ Rs.44554.00 for Category-I / Rmtr & Rs. 42743.00 for Category-II / Rmtr

B Claye Soil (7m dia. Well)

(I) Depth below bed level upto 3.0 M Rmtr 12070.00 11580.00

(ii) Beyond 3m upto 10m depth Rmtr 17300.00 16610.00

(iii) Beyond 10 m upto 20 m

a Add 5 per cent for every additional meter depth

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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of sinking over the rate of sinking for the previous meter 10th @ Rs.17300.00 for Category-I / Rmtr & Rs. 16610.00 for Category-II / Rmtr

b Add for dewatering @ 5 per cent of cost, if required. over 11th meter @ Rs.18165.00 for Category-I / Rmtr & Rs. 17440.00 for Category-II / Rmtr

(iv) Beyond 20m upto 30 m

a Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.28175.00 for Category-I / Rmtr & Rs. 27050.00 for Category-II / Rmtr

b Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour over 21st meter @ Rs.30288.00 for Category-I / Rmtr & Rs. 29078.00 for Category-II / Rmtr

c Add 5 per cent of cost for dewatering on the cost, if required over 21st meter @ Rs.37860.00 for Category-I / Rmtr & Rs. 36347.00 for Category-II / Rmtr

(v) Beyond 30m upto 40 m

a Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.58062.00 for Category-I / Rmtr & Rs. 55744.00 for Category-II / Rmtr

b Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour over 31st meter @ Rs.63868.00 for Category-I / Rmtr & Rs. 61318.00 for Category-II / Rmtr

c Add 5 per cent of cost for dewatering, if required over 31st meter @ Rs.76641.00 for Category-I / Rmtr & Rs. 73581.00 for Category-II / Rmtr

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
C		Soft Rock (7m dia well) Depth in soft rock strata upto 3m	Rmtr	20610.00	19780.00
D		Hard Rock (7m dia well) Depth in Hard rock strata up to 3 m	Rmtr	31170.00	29920.00
12.14	1200	Providing & Sinking of 8 m external diameter well (other than pneumatic method of sinking) as per drawing. Depth of sinking is reckoned from bed level. Using machinery, crane with grab bucket with safety precautions including cost of all materials, hire charge of machineries, labour, lead, lift, loading, unloading etc., complete including Kentledge supports loading arrangements and dewatering wherever necessary			
A		<u>Sandy Soil</u>			
	(i)	Depth below bed level upto 3.0 M	Rmtr	11030.00	10590.00
	(ii)	Beyond 3m upto 10m depth	Rmtr	13550.00	13000.00
	(iii)	Beyond 10m upto 20m			
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.13550.00 for Category-I / Rmtr & Rs. 13000.00 for Category-II / Rmtr			
	(iv)	Beyond 20m upto 30 m			
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.22065.00 for Category-I / Rmtr & Rs. 21171.00 for Category-II / Rmtr			
	b	Add 20 per cent of cost for Kentledge including			

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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supports, loading arrangement and Labour over 21st meter @ Rs.23719.00 for Category-I / Rmtr & Rs. 22758.00 for Category-II / Rmtr

(v) **Beyond 30m upto 40 m**

a Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.45468.00 for Category-I / Rmtr & Rs. 43626.00 for Category-II / Rmtr

b Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc. over 31st meter @ Rs.50014.00 for Category-I / Rmtr & Rs. 47988.00 for Category-II / Rmtr

B

Clayey Soil (8m dia. Well)

(i) **Depth from bed level upto 3.0 M**

Rmtr 14750.00 14160.00

(ii) **Beyond 3m upto 10m depth**

Rmtr 18010.00 17250.00

(iii) **Beyond 10 m upto 20 m**

a Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.18010.00 for Category-I / Rmtr & Rs. 17250.00 for Category-II / Rmtr

b Add for dewatering @ 5 per cent of cost, if required over 11th meter @ Rs.18910.00 for Category-I / Rmtr & Rs. 18112.00 for Category-II / Rmtr.

(iv) **Beyond 20m upto 30 m**

a Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.29330.00 for Category-I / Rmtr & Rs. 28092.00 for Category-II / Rmtr.

b Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour over 21st meter @ Rs.31529.00 for Category-I / Rmtr & Rs. 30198.00 for Category-II / Rmtr.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
		c Add 5 per cent of cost for dewatering on the cost, if required over 21st meter @ Rs.39411.00 for Category-I / Rmtr & Rs. 37747.00 for Category-II / Rmtr.			
		(v) Beyond 30m upto 40 m			
		a Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.60441.00 for Category-I / Rmtr & Rs. 57891.00 for Category-II / Rmtr.			
		b Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour over 31st meter @ Rs.66485.00 for Category-I / Rmtr & Rs. 63680.00 for Category-II / Rmtr			
		c Add 5 per cent of cost for dewatering, if required over 31st meter @ Rs.79782.00 for Category-I / Rmtr & Rs. 76416.00 for Category-II / Rmtr			
		C Soft Rock (8m dia well)			
		Depth in soft rock strata upto 3m	Rmtr	23190.00	22260.00
		D Hard Rock (8m dia well)			
		Depth in hard rock strata upto 3 m	Rmtr	32100.00	30800.00
12.15	1200	Providing & Sinking of 9 m external diameter well (other than pneumatic method of sinking) as per drawing. Depth of sinking is reckoned from bed level. Using machinery, crane with grab bucket with safety precautions including cost of all materials, hire charge of machineries, labour, lead, lift, loading, unloading etc., complete including Kentledge supports loading arrangements and dewatering wherever necessary			
		A Sandy Soil			
		(i) Depth below bed level upto 3.0 M	Rmtr	11180.00	10700.00
		(ii) Beyond 3m upto 10m depth	Rmtr	14930.00	14300.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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(iii) Beyond 10m upto 20m

- a Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.14930.00 for Category-I / Rmtr & Rs. 14300.00 for Category-II / Rmtr.

(iv) Beyond 20m upto 30 m

- a Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.24313.00 for Category-I / Rmtr & Rs. 23289.00 for Category-II / Rmtr .
- b Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour@ over 21st meter Rs.26136.00 for Category-I / Rmtr & Rs. 25035.00 for Category-II / Rmtr .

(v) Beyond 30m upto 40 m

- a Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs. 50105.00 for Category-I / Rmtr & Rs. 47992.00 for Category-II / Rmtr .
- b Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc ., over 31st meter @ Rs.55115.00 for Category-I / Rmtr & Rs. 52791.00 for Category-II / Rmtr .

B

Claye Soil (9m dia. Well)

- (i) Depth below bed level upto 3.0 M Rmtr 15550.00 14950.00
- (ii) Beyond 3m upto 10m depth Rmtr 18400.00 17650.00
- (iii) Beyond 10 m upto 20 m

- a Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.18400.00 for Category-I / Rmtr & Rs. 17650.00 for Category-II / Rmtr .

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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- b Add for dewatering @ 5 per cent of cost, if required. over 11th meter @ Rs.19320.00 for Category-I / Rmtr & Rs. 18532.00 for Category-II / Rmtr .

(iv) **Beyond 20m upto 30 m**

- a Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.29969.00 for Category-I / Rmtr & Rs. 28743.00 for Category-II / Rmtr .
- b Add 25 per cent of cost for Kentledge including supports, loading arrangement and Labour over 21st meter @ Rs. 32216.00 for Category-I / Rmtr & Rs. 30898.00 for Category-II / Rmtr .
- c Add 5 per cent of cost for dewatering on the cost, if required over 21st meter @ Rs.40270.00 for Category-I / Rmtr & Rs.38622.00 for Category-II / Rmtr .

(v) **Beyond 30m upto 40 m**

- a Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.61760.00 for Category-I / Rmtr & Rs. 59233.00 for Category-II / Rmtr.
- b Add 20 per cent of cost for Kentledge including supports, loading arrangement and Labour over 31st meter @ Rs.67936.00 for Category-I / Rmtr & Rs. 65156.00 for Category-II / Rmtr.
- c Add 5 per cent of cost for dewatering, if required over 31st meter @ Rs.81523.00 for Category-I / Rmtr & Rs. 78187.00 for Category-II / Rmtr.

C	Soft Rock (9m dia well)		
	Depth in soft rock strata up to 3m	Rmtr	29290.00 28120.00
D	Hard Rock (9m dia well)		
	Depth in hard rock strata upto 3 m	Rmtr	36710.00 35240.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
12.16	1200	Providing & Sinking of 10 m external diameter well (other than pneumatic method of sinking) as per drawing . Depth of sinking is reckoned from bed level. Using machinery, crane with grab bucket with safety precautions including cost of all materials, hire charge of machineries, labour, lead, lift, loading, unloading etc., complete including Kentledge supports loading arrangements and dewatering wherever necessary			
	A	<u>Sandy Soil</u>			
	(i)	Depth below bed level upto 3.0 M	Rmtr	13410.00	12870.00
	(ii)	Beyond 3m upto 10m depth	Rmtr	15760.00	15130.00
	(iii)	Beyond 10m upto 20m			
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.15760.00 for Category-I / Rmtr & Rs.15130.00 for Category-II / Rmtr .			
	(iv)	Beyond 20m upto 30 m			
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.25666.00 for Category-I / Rmtr & Rs. 24640.00 for Category-II / Rmtr .			
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and labour over 21st meter@ Rs.27590.00 for Category-I / Rmtr & Rs. 26488.00 for Category-II / Rmtr.			
	(v)	Beyond 30m upto 40 m			
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.52892.00 for Category-I / Rmtr & Rs. 50776.00 for Category-II / Rmtr .			

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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- b** Add 20 per cent of cost for Kentledge including supports, loading arrangement, and Labour etc. over 31st meter @ Rs.58181.00 for Category-I / Rmtr & Rs. 55853.00 for Category-II / Rmtr .

B Claye Soil (10m dia. Well)

- (i) Depth below bed level upto 3.0 M Rmtr 17260.00 16570.00
- (ii) Beyond 3m upto 10m depth Rmtr 19100.00 18350.00

(iii) Beyond 10 m upto 20 m

- a** Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.19100.00 for Category-I / Rmtr & Rs. 18350.00 for Category-II / Rmtr.

- b** Add for dewatering @ 5 per cent of cost, if required over 11th meter @ Rs.20055.00 for Category-I / Rmtr & Rs. 19267.00 for Category-II / Rmtr.

(iv) Beyond 20m upto 30 m

- a** Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.31105.00 for Category-I / Rmtr & Rs. 29885.00 for Category-II / Rmtr.

- b** Add 25 per cent of cost for Kentledge including supports, loading arrangement and labour over 21st meter @ Rs.33437.00 for Category-I / Rmtr & Rs. 32126.00 for Category-II / Rmtr.

- c** Add 5 per cent of cost for dewatering on the cost, if required 21st meter @ Rs.41796.00 for Category-I / Rmtr & Rs. 40157.00 for Category-II / Rmtr.

(v) Beyond 30m upto 40 m

- a** Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.64099.00 for Category-I / Rmtr & Rs. 61588.00 for Category-II / Rmtr.

Sl. No.	Rate Rs. Minor Bridge Cat-II
12	

Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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per cent of cost for Kentledge including
ts, loading arrangement and labour over
ster @ Rs.70508.00 for Category-I / Rmtr &
'46.00 for Category-II / Rmtr

per cent of cost for dewatering, if required
over 31st meter @ Rs.84609.00 for Category-I/
Rmtr & Rs. 81295.00 for Category-II / Rmtr.

C	Soft Rock (10m dia well)		
	Depth in soft rock strata upto 3m	Rmtr 29900.00	28700.00
D	Hard Rock (10m dia well)		
	Depth in hard rock strata upto 3 m	Rmtr 41600.00	39950.00

12.17 1200

Providing & Sinking of 11 m external diameter
well (other than pneumatic method of sinking)
as per drawing. Depth of sinking is reckoned
from bed level. Using machinery, crane with grab
bucket with safety precautions including cost of all
materials, hire charge of machineries, labour, lead,
lift, loading, unloading etc., complete including
Kentledge supports loading arrangements and
dewatering wherever necessary

A	<u>Sandy Soil</u>		
(i)	Depth from bed level upto 3.0 M	Rmtr 30750.00	29520.00
(ii)	Beyond 3m upto 10m depth	Rmtr 32850.00	31550.00
(iii)	Beyond 10m upto 20m		
a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.32850.00 for Category-I / Rmtr & Rs. 31550.00 for Category-II / Rmtr.		
(iv)	Beyond 20m upto 30 m		
a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.53502.00 for Category-I / Rmtr & Rs. 51387.00 for Category-II / Rmtr.		

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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- b Add 20 per cent of cost for Kentledge including supports, loading arrangement and labour 21st meter @ Rs.57514.00 for Category-I / Rmtr & Rs. 55241.00 for Category-II / Rmtr.

(v) **Beyond 30m upto 40 m**

- a Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.110262.00 for Category-I / Rmtr & Rs. 105903.00 for Category-II / Rmtr.

- b Add 20 per cent of cost for Kentledge including supports, loading arrangement, and labour etc. @ over 31st meter Rs.121288.00 for Category-I / Rmtr & Rs. 116493.00 for Category-II / Rmtr.

B **Clayey Soil (11 m dia. Well)**

- (i) **Depth from bed level upto 3.0 M**

Rmtr 32790.00 31480.00

- (ii) **Beyond 3m upto 10m depth**

Rmtr 39300.00 37750.00

- (iii) **Beyond 10 m upto 20 m**

- a Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.39300.00 for Category-I / Rmtr & Rs. 37750.00 for Category-II / Rmtr.

- b Add for dewatering @ 5 per cent of cost, if required, over 11th meter @ Rs.41265.00 for Category-I / Rmtr & Rs. 39637.00 for Category II / Rmtr.

- (iv) **Beyond 20m upto 30 m**

- a Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.64011.00 for Category-I / Rmtr & Rs.61483.00 for Category-II / Rmtr.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
	b	Add 25 per cent of cost for Kentledge including supports, loading arrangement and labour over 21st meter @ Rs.68811.00 for Category-I / Rmtr & Rs. 66094.00 for Category-II / Rmtr.			
	c	Add 5 per cent of cost for dewatering on the cost, if required over 21st meter @ Rs.86013.00 for Category-I / Rmtr & Rs.82617.00 for Category-II / Rmtr.			
	(v)	Beyond 30m upto 40 m			
	a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.131919.00 for Category-I / Rmtr & Rs. 126713.00 for Category-II / Rmtr.			
	b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and labour over 31st meter @ Rs.145110.00 for Category-I / Rmtr & Rs. 139384.00 for Category-II / Rmtr.			
	c	Add 5 per cent of cost for dewatering, if required over 31st meter @ Rs.174132.00 for Category-I / Rmtr & Rs. 167260.00 for Category-II / Rmtr.			
C		<u>Soft Rock (11m dia well)</u>			
		Depth in soft rock strata upto 3m	Rmtr	67220.00	64530.00
D		<u>Hard Rock (11m dia well)</u>			
		Depth in hard rock upto 3 m	Rmtr	92950.00	89200.00
12.18 1200		Providing & Sinking of 12 m external diameter well (other than pneumatic method of sinking) as per drawing . Depth of sinking is reckoned from bed level. Using machinery, <u>crane with grab bucket</u> with safety precautions including cost of all			

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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materials, hire charge of machineries, labour, lead, lift, loading, unloading etc., complete including Kentledge supports loading arrangements and dewatering wherever necessary.

A

Sandy Soil

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|-------|---|------|----------|----------|
| (i) | I) Depth below bed level upto 3.0 M | Rmtr | 63750.00 | 61200.00 |
| (ii) | Beyond 3m upto 10m depth | Rmtr | 71750.00 | 68850.00 |
| (iii) | Beyond 10m upto 20m | | | |
| a | Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.71750.00 for Category-I / Rmtr & Rs. 68850.00 for Category-II / Rmtr. | | | |
| (iv) | Beyond 20m upto 30 m | | | |
| a | Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.116867.00 for Category-I / Rmtr & Rs.112144.00 for Category-II / Rmtr. | | | |
| b | Add 20 per cent of cost for Kentledge including supports, loading arrangement and labour over 21st @ Rs.125632.00 for Category-I / Rmtr & Rs.120554.00 for Category-II / Rmtr. | | | |
| (v) | Beyond 30m upto 40 m | | | |
| a | Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.240861.00 for Category-I / Rmtr & Rs. 231126.00 for Category-II / Rmtr. | | | |
| b | Add 20 per cent of cost for Kentledge including supports, loading arrangement, and labour etc. over 31st meter @ Rs.264947.00 for Category-I / Rmtr & Rs. 254238.00 for Category-II / Rmtr. | | | |

Ref. to SRT & H cification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
B	Clayey Soil (12 m dia. Well)			
(i)	Depth below bed level upto 3.0 M	Rmtr	70050.00	67250.00
(ii)	Beyond 3m upto 10m depth	Rmtr	99650.00	95700.00
(iii)	Beyond 10 m upto 20 m			
a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.99650.00 for Category-I / Rmtr & Rs. 95700.00 for Category-II / Rmtr.			
b	Add for dewatering @ 5 per cent of cost, if required over 11th meter @ Rs.104632.00 for Category-I / Rmtr & Rs. 100485.00 for Category-II / Rmtr.			
(iv)	Beyond 20m upto 30 m			
a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.162313.00 for Category-I / Rmtr & Rs. 155880.00 for Category-II / Rmtr.			
b	Add 25 per cent of cost for Kentledge including supports, loading arrangement and labour over 21st meter @ Rs.174486.00 for Category-I / Rmtr & Rs. 167571.00 for Category-II / Rmtr.			
c	Add 5 per cent of cost for dewatering on the cost, if required over 21st meter @ Rs.218107.00 for Category-I / Rmtr & Rs. 209463.00 for Category-II / Rmtr.			
(v)	Beyond 30m upto 40 m			
a	Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.334526.00 for Category-I / Rmtr & Rs. 321266.00 for Category-II / Rmtr.			
b	Add 20 per cent of cost for Kentledge including supports, loading arrangement and labour over 31st			

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
		meter @ Rs.367978.00 for Category-I / Rmtr & Rs. 353392.00 for Category-II / Rmtr.			
	c	Add 5 per cent of cost for dewatering, if required over 31st meter @ Rs.441573.00 for Category-I / Rmtr & Rs. 424070.00 for Category-II / Rmtr.			
C		<u>Soft Rock (12m dia well)</u>			
		Depth in soft rock strata upto 3m	Rmtr	158350.00	152050.00
D		<u>Hard Rock (12m dia well)</u>			
	(i)	Depth in hard rock strata upto 3 m	Rmtr	208600.00	200300.00
12.19	1200	Sinking of Twin D Type well (other than pneumatic method of sinking) of overall length 12mtr and overall width 6mtr. as per drawing. Depth of sinking is reckoned from bed level. Using machinery, crane with grab bucket with safety precautions including cost of all materials, hire charge of machineries, labour, lead, lift, loading, unloading etc., complete including Kentledge supports loading arrangements and dewatering wherever necessary			
	A	<u>Sandy Soil</u>			
	(i)	Depth from bed level upto 3.0 M	Rmtr	14450.00	13850.00
	(ii)	Beyond 3m upto 10m depth	Rmtr	15550.00	14950.00
	(iii)	Beyond 10m upto 20m			
	a	Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.15550.00 for Category-I / Rmtr & Rs. 14950.00 for Category-II / Rmtr.			
	(iv)	Beyond 20m upto 30 m			
	a	Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 20th @ Rs.25324.00 for Category-I / Rmtr & Rs. 24346.00 for Category-II / Rmtr.			

Ref. to IT & H lication	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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- b** Add 20 per cent of cost for Kentledge including supports, loading arrangement and labour over 21st meter @ Rs.27223.00 for Category-I / Rmtr & Rs. 26171.00 for Category-II / Rmtr.

(v) Beyond 30m upto 40 m

- a** Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 31st meter @ Rs.52185.00 for Category-I / Rmtr & Rs. 50170.00 for Category-II / Rmtr.

- b** Add 20 per cent of cost for Kentledge including supports, loading arrangement, and labour etc. over 31st meter @ Rs.57403.00 for Category-I / Rmtr & Rs. 55187.00 for Category-II / Rmtr.

B

Clayey Soil (Twin D Type Well)

- (i) Depth below bed level upto 3.0 M** **Rmtr** **16900.00 16200.00**

- (ii) Beyond 3m upto 10m depth** **Rmtr** **21150.00 20300.00**

(iii) Beyond 10 m upto 20 m

- a** Add 5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 10th @ Rs.21150.00 for Category-I / Rmtr & Rs. 20300.00 for Category-II / Rmtr

- b** Add for dewatering @ 5 per cent of cost, if required over 11th meter @ Rs.22207.00 for Category-I / Rmtr & Rs. 21315.00 for Category-II / Rmtr.

(iv) Beyond 20m upto 30 m

- a** Add 7.5 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 21st @ Rs.34446.00 for Category-I / Rmtr & Rs. 33062.00 for Category-II / Rmtr.

- b** Add 25 per cent of cost for Kentledge including supports, loading arrangement and labour over 21st meter @ Rs.37029.00 for Category-I / Rmtr & Rs. 35541.00 for Category-II / Rmtr.

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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- c Add 5 per cent of cost for dewatering on the cost, if required over 21st meter @ Rs.46286.00 for Category-I / Rmtr & Rs.44426.00 for Category-II / Rmtr.

(v) **Beyond 30m upto 40 m**

- a Add 10 per cent for every additional meter depth of sinking over the rate of sinking for the previous meter 30th @ Rs.70988.00 for Category-I / Rmtr & Rs. 68135.00 for Category-II / Rmtr.

- b Add 20 per cent of cost for Kentledge including supports, loading arrangement and labour over 31st meter @ Rs.78086.00 for Category-I / Rmtr & Rs.74948.00 for Category-II / Rmtr.

- c Add 5 per cent of cost for dewatering, if required over 31st meter @ Rs.93703.00 for Category-I / Rmtr & Rs. 89937.00 for Category-II / Rmtr.

C **Soft Rock (Twin D Type Well)**
Depth in soft rock strata upto 3m

Rmtr 33250.00 31900.00

D **Hard Rock (Twin D Type Well)**
Depth in soft rock strata upto 3m

Rmtr 44650.00 42850.00

12.21 1210

Providing **Sand Filling in Wells** complete as per Drawing including cost of all materials, labour, hire charges of machinery, compating, loading, unloading, lead, lifts, transportation etc., complete. **Cum 2940.00 2830.00**

Material	FA
Requirement:	1.20 cum

12.22 1200 & 1900

Providing **Steel Liner 10 mm thick for the Curbs and 6 mm thick for Steining of Wells** Fabricating and Setting out as per Detailed Drawing including cost of materials, labour, hire

Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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charges of machineries, loading, unloading, lead,
transportation etc., complete.

MT. 72410.00 69520.00

<i>Material</i>	<i>Structural Steel</i>
<i>Requirement:</i>	<i>1050.00 Kg</i>

- 12.23 1100 & 1700** Providing **Bored Cast-in-situ M35 grade R.C.C. Pile excluding Reinforcement** complete as per Drawing, removal of excavated earth using machineries hydraulic piling rig with power unit, light crane for lowering the reinforcement cage, transporting by the tipper including cost of all materials, lead, lifts, loading, unloading, hire charges of machineries, transportation etc. complete.

Pile diameter-750 mm

Rmtr 5200.00 4990.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	<i>185.00 Kg</i>	<i>0.199 Cum</i>	<i>0.397 Cum</i>

- 12.24** -- do -- **Pile diameter-1000 mm**

Rmtr 8630.00 8290.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	<i>329.00 Kg</i>	<i>0.353 Cum</i>	<i>0.706 Cum</i>

- 12.25** -- do -- **Pile diameter-1200 mm**

Rmtr 11240.00 10790.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	<i>473.84 Kg</i>	<i>0.509 Cum</i>	<i>1.107 Cum</i>

- 12.26 1100 & 1700**

Providing **Driven cast-in-place vertical M35 grade R.C.C. Pile excluding Reinforcement** complete as per Drawing, including cost of CI shoe for pile, MS clamp for shoe, steel helmet and cushion block for casing head, piling rig double action pile driving hammer, crane, including cost of all materials, labour, hire charges of machineries, loading, unloading, lead, lifts etc., complete.

Pile diameter - 750 mm

Rmtr 4160.00 4000.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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<i>Material Requirement:</i>	<i>Cement</i> 185.13 Kg	<i>FA</i> 0.199 Cum	<i>Metal</i> 0.397 Cum		
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12.27 -- do -- Pile diameter - 1000 mm Rmtr 6780.00 6510.00

<i>Material Requirement:</i>	<i>Cement</i> 329.17 Kg	<i>FA</i> 0.353 Cum	<i>Metal</i> 0.707 Cum		
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12.28 -- do -- Pile diameter - 1200 mm Rmtr 9900.00 9500.00

<i>Material Requirement:</i>	<i>Cement</i> 474.00 Kg	<i>FA</i> 0.509 Cum	<i>Metal</i> 1.017 Cum		
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Note In case steel lining is included in the design for driven cast-in-situ pile and is planned to be retained, the same may be included in the rate analysis. In case the temporary steel casing used during casting is planned to be removed, an additional cost @ 0.50% of cost of concrete may be provided to cover its usage.

12.29 1100 & 1700 Providing Driven Precast vertical M35 grade R.C.C. Pile, excluding Reinforcement complete as per Drawing, including cost of CI shoe for pile, MS shoe, steel helmet and cushion block for casing head, piling rig including double action vibrating pile driving hammer with power unit, crane, including cost of all materials, labour, hire charges of machineries, loading, unloading, lead, lifts etc., complete.

Pile Diameter = 500 mm Rmtr 1970.00 1890.00

<i>Material Requirement:</i>	<i>Cement</i> 82.853 Kg	<i>FA</i> 0.088 Cum	<i>Metal</i> 0.177 Cum		
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12.30 1100 & 1700 -- do -- Pile Diameter = 750 mm Rmtr 3430.00 3300.00

<i>Material Requirement:</i>	<i>Cement</i> 186.355 Kg	<i>FA</i> 0.199 Cum	<i>Metal</i> 0.397 Cum		
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12.31 1100 & 1700 -- do -- Pile Diameter = 1000 mm Rmtr 5780.00 5550.00

<i>Material Requirement:</i>	<i>Cement</i> 331.27 Kg	<i>FA</i> 0.353 Cum	<i>Metal</i> 0.707 Cum		
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Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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Providing Driven Precast vertical M35 grade R.C.C. pile, excluding Reinforcement complete as per drawing, including cost of CI shoe for pile, MS shoe, steel, helmet and cushion block for casing head, piling rig, double action vibrating pile driving hammer with power unit, crane, including cost of all materials, labour, hire charges of machineries, loading, unloading, lead, lifts etc., complete.

Size of pile - 300 mm x 300 mm Rmtr 1310.00 1260.00

Material Requirement:	Cement 37.98 Kg	FA 0.041 Cum	Metal 0.081 Cum
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12.33 1100 & 1700 -- do -- Size of pile - 500 mm x 500 mm Rmtr 2240.00 2150.00

Material Requirement:	Cement 105.50 Kg	FA 0.113 Cum	Metal 0.225 Cum
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12.34 1100 & 1700 -- do -- Size of pile - 750 mm x 750 mm Rmtr 4310.00 4140.00

Material Requirement:	Cement 237.375 Kg	FA 0.253 Cum	Metal 0.506 Cum
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12.35 1100, 1900 Providing Driven Vertical Steel Piles H section steel column as per Drawing, using 10 T capacity crane driving with vibrating pile driving hammer with power unit including cost of all materials, labour, hire charges of machineries, loading, unloading, lead, lifts, transportation etc., complete.

Section of the pile - H Section steel column
400 x 250 mm (ISHB Series)

Rmtr 4590.00 4410.00

Material Requirement:	Structural Steel 86.286 Kg
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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12.36	1100 & 1900	-- do -- Section of the pile - H Section steel column 450 x 250 mm (ISHB Series)	Rmtr	5190.00	4980.00
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Material Requirement:	Structural Steel 97.167 Kg
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12.37	1100	Pile Load Test on single Vertical Pile in accordance with IS:2911(Part-IV)			
	a	Initial and routine load test	MT.	300.00	300.00
	b	Lateral load test	MT.	5000.00	5000.00

12.38	1100	Providing Cement Concrete for Reinforced Concrete in Pile Cap using granite/trap/basalt stone aggregate of 20mm & down size & clean sieved approved fine aggregate or double washed crushed metal sand mixing mechanically, vibrating, compacting as per Drawing including cost of all materials labour, hire charges of machineries, loading, unloading, lead, lift, transportation etc., complete. (excluding cost of steel and fabrication charges)			
	(i)	Using Concrete Mixer			
	A	RCC M20	Cum	6170.00	5920.00

Material Requirement:	Cement 341.33 Kg	FA 0.45 Cum	Metal 0.90 Cum
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B	RCC M25	Cum	5580.00	5310.00
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Material Requirement:	Cement 399.33 Kg	FA 0.45 Cum	Metal 0.90 Cum
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C	RCC M30	Cum	6630.00	6360.00
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Material Requirement:	Cement 406.67 Kg	FA 0.45 Cum	Metal 0.90 Cum
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D	RCC M35	Cum	6740.00	6470.00
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Material Requirement:	Cement 422.00 Kg	FA 0.45 Cum	Metal 0.90 Cum
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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(ii) Using Batching Plant, Transit Mixer and Concrete Pump with lead for mix upto 1 km.

A RCC M20 Cum 5490.00 5270.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	341.33 Kg	0.45 Cum	0.90 Cum

B RCC M25 Cum 5900.00 5670.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	399.33 Kg	0.45 Cum	0.90 Cum

C RCC M30 Cum 5950.00 5710.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	406.67 Kg	0.45 Cum	0.90 Cum

D RCC M35 Cum 6060.00 5820.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	422.00 Kg	0.45 Cum	0.90 Cum

12.39 1100& 1700 Levelling Course for Pile cap

Providing and laying plain **Cement Concrete M15** nominal mix proportion for levelling course 100 mm thick layer below the pile cap using granite/trap/basalt stone aggregate of **40mm** & down size & clean sieved approved fine aggregate or dubble washed crushed metal sand in foundation, mixing mechanically, vibrating with needle vibrator, formwork, centring, curing, cost of all materials, labour, hire charges of machinery, lead, lift, loading, unloading, stacking, finishing the exposed faces etc., complete

Cum 5340.00 5120.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	275.33 Kg	0.45 Cum	0.90 Cum

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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12.40 1600 Providing TMT Steel bar reinforcement conforming to IS-1786, in foundation including straightening bars, cutting, bending, hooking, binding with approved quality binding wire after placing in position, tying, lapping and / or welding wherever required and anchoring to the adjoining members wherever necessary as per drawing (laps, hooks and wastages shall not be measured and paid) including cost of all materials, bar bending charges, labour, lifts etc., complete.

- | | | |
|-----|--------------|------------------------------|
| i) | FE 500 Grade | MT. 70400.00 67600.00 |
| ii) | FE 550 Grade | MT. 71100.00 68200.00 |

<i>Material</i>	<i>TMT Steel</i>	<i>Binding Wire</i>
<i>Requirement:</i>	<i>1050 Kg</i>	<i>6.00 Kg</i>

12.41 1600 Providing Mild Steel reinforcement conforming to IS-432, IS-240 Grade designation as per table 1000-3 in foundation including straightening bars, cutting, bending, hooking, binding with approved quality binding wire after placing in position, tying, lapping and / or welding wherever required and anchoring to the adjoining members wherever necessary as per drawing (laps, hooks and wastages shall not be measured and paid) including cost of all materials, bar bending charges, labour, lifts etc., complete.

MT. 54670.00 52490.00

<i>Material</i>	<i>Mild Steel</i>	<i>Binding Wire</i>
<i>Requirement:</i>	<i>1050 Kg</i>	<i>6.00 Kg</i>

Note Where ever concrete is carried out using batching plant, transit mixer, concrete pump, Admixtures @ 0.4 per cent of weight of cement may be added for achieving desired slump of concrete.

12.42 Addl. FUSION BONDING EPOXY COATING (FBEC)

Providing fusion bonding epoxy coating not less than 175microns thickness and up to 300 microns to reinforcement of all diameters (at saline climatic

Sl. No.	Ref. to MoSRT & H Specification	Description
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(ii) Using Batching Plant, Transit Concrete Pump with lead for 1

A RCC M20

Material Requirement: Cement 341.33 Kg

B RCC M25

Material Requirement: Cement 390

C RCC M30

Material Requirement:

D

Material Requirement:

MT. 70400.00 67600.00
MT. 71100.00 68200.00

Description

Unit

Rate Rs. Major Bridge Cat-I
Rate Rs. Minor Bridge Cat-II

Rate Rs. Major Bridge Cat-I
Rate Rs. Minor Bridge Cat-II

12.39 11008

0.00

CHAPTER - 13

SUBSTRUCTURE

Preamble :

1. Although, Substructures are generally constructed in cement concrete, the rate analysis for brick / stone masonry in CM 1:3 have also been included which can be adopted if permitted by design.
2. Bridge bearing, being commercial items produced by specialized firms with imported technology parts, the rates for the same are required to be ascertained from the market for the approved design and technical specifications.
3. Filter media and back filling behind abutments are required to be provided as per guidelines given in IRC: 78-2014.
4. Weep holes shall be provided as per Clause 2706 of MoSRT&H Specifications.
5. All bearings shall be set truly level so as to have full and even seating.
6. For elastomeric bearing pads, the concrete surface shall be levelled such that the variation is not more than 1.5 mm from a straight edge placed in any direction across the area.
7. The bearing should be procured only from those manufacturers who have been pre-qualified by The Ministry of Shipping, Road Transport and Highways.
8. RCC mix design to be got approved with minimum cement constant mention in this chapter are to be maintained.

CHAPTER-13

SUBSTRUCTURE

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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13.01	1300 & 2200	Providing and Constructing Burnt Brick masonry with approved quality non modular bricks of standard size and of first class designation in C.M. 1:3 using clean sieved approved fine aggregate or dubble washed crushed metal fine aggregate or dubble washed crushed metal sand mixed in concrete mixer for sub-structure (excluding pointing and plastering,) as per drawing, including cost all materials, labour, scaffolding, curing, transportation, loading, unloading, lead, lift, etc., complete.		Cum 7520.00	7220.00
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<i>Material</i>	<i>Brick</i>	<i>Cement</i>	<i>FA</i>
<i>Requirement:</i>	500 Nos	122.40 Kg	0.252 Cum

13.02	1300 & 2200	Providing ruled pointing with C.M. 1:3 on brick work using clean sieved approved fine aggregate or dubble washed crushed metal fine aggregate or dubble washed crushed metal sand mixed in concrete mixer in substructure as per drawing 20mm deep after raking joints to a depth of 20mm, nicely lining to plumb and level including cost of all materials, labour, scaffolding, curing, transportation, loading, unloading, lead, lift, etc., complete.	Sqm	79.80	76.60
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<i>Material</i>	<i>Cement</i>	<i>FA</i>
<i>Requirement:</i>	1.53 Kg	0.0031 Cum

13.03	1300 & 2200	Providing plastering 12 mm thick with C.M. 1:3 on brick work using clean sieved approved fine aggregate or dubble washed crushed metal fine aggregate or dubble washed crushed metal sand mixed in concrete mixer in substructure as per drawing, including cost of all materials, labour, curing, scaffolding, transportation, loading, unloading, lead, lift, etc., complete.	Sqm	150.00	145.00
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<i>Material</i>	<i>Cement</i>	<i>FA</i>
<i>Requirement:</i>	7.34 Kg	0.015 Cum

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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13.04 1400 & 2200 Providing and constructing granite/trap/basalt rubble masonry in C.M. 1:3 using clean sieved approved fine aggregate or dubble washed crushed metal fine aggregate or dubble washed crushed metal sand mixed in concrete mixer for substructure complete as per drawing, in courses not less than 15 cms high, bond stones 2m apart in each course including cost of all materials, labour, scaffolding, curing, transportation, loading, unloading, lead, lift, etc., complete.

A Random Rubble Masonry (coursed) using stones hammer dressed on all sides and beds except face

Cum 5190.00 4990.00

<i>Material Requirement:</i>	<i>Stones</i> 1.16 Cum	<i>Cement</i> 168.39 Kg	<i>FA</i> 0.346 Cum
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B Coursed rubble masonry (first sort) using stones chisel dressed on all sides and beds except face

Cum 5500.00 5280.00

<i>Material Requirement:</i>	<i>Stones</i> 1.26 Cum	<i>Cement</i> 153 Kg	<i>FA</i> 0.315 Cum
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C Ashlar masonry (first sort) Plain ashlar using stones chisel dressed on all sides and beds including face

Cum 7150.00 6860.00

<i>Material Requirement:</i>	<i>Stones</i> 1.26Cum	<i>Cement</i> 168.30 Kg	<i>FA</i> 0.34 Cum
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13.05 1500,

1700 & 2200

Providing & laying PCC/RCC mix in substructure as per drawing using granite/trap/basalt aggregates of 40/20mm and down size and clean sieved approved fine aggregate or dubble washed crushed metal sand, form work, scaffolding, mixing mechanically, laid in layers of 15cms thick in each layer,well compacted, centering, vibrating, including cost

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, curing, finishing the exposed faces etc., complete.

A PCC M15 using Concrete Mixer (40mm & Down Size)

(p) Height upto 5m

Cum 5890.00 5660.00

<i>Material Requirement:</i>	<i>Metal</i> 0.90 Cum	<i>Cement</i> 275.33 Kg	<i>FA</i> 0.45 Cum
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B PCC M20 using Concrete Mixer (40mm & Down Size)

(p) Height upto 5m

Cum 6420.00 6170.00

<i>Material Requirement:</i>	<i>Metal</i> 0.90 Cum	<i>Cement</i> 344.00 Kg	<i>FA</i> 0.45 Cum
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C PCC M25 (40mm & Down Size)

(p) Height upto 5m

Cum 6840.00 6560.00

(i) Using Concrete Mixer

(ii) With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.

Cum 6100.00 5850.00

(q) Height 5m to 10m

(i) Using concrete Mixer

Cum 7090.00 6800.00

(ii) With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.

Cum 6320.00 6070.00

(r) Height above 10m

(i) Using concrete Mixer

Cum 7400.00 7100.00

(ii) With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.

Cum 6600.00 6330.00

<i>Material Requirement:</i>	<i>Metal</i> 0.90 Cum	<i>Cement</i> 399.33 Kg	<i>FA</i> 0.45 Cum
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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D PCC M30 (40mm & Down Size)

(p)	Height upto 5m				
(i)	Using concrete Mixer	Cum	6880.00	6610.00	
(ii)	With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.	Cum	6140.00	5890.00	
(q)	Height 5m to 10m				
(i)	Using concrete Mixer	Cum	7130.00	6850.00	
(ii)	With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.	Cum	6360.00	6110.00	
(r)	Height above 10m				
(i)	Using concrete Mixer	Cum	7440.00	7150.00	
(ii)	With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.	Cum	6640.00	6380.00	

<i>Material Requirement:</i>	<i>Metal 0.90 Cum</i>	<i>Cement 405.33 Kg</i>	<i>FA 0.45 Cum</i>
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E RCC M20 (20mm & Down Size)

(p)	Height upto 5m				
(i)	Using concrete Mixer	Cum	6530.00	6270.00	
(ii)	With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.	Cum	5790.00	5560.00	
(q)	Height 5m to 10m				
(i)	Using concrete Mixer	Cum	6770.00	6500.00	
(ii)	With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.	Cum	6000.00	5760.00	

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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(r) Height above 10m

(i) Using Concrete Mixer Cum 7060.00 6780.00

(ii) With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km. Cum 6260.00 6010.00

<i>Material</i>	<i>Metal</i>	<i>Cement</i>	<i>FA</i>
<i>Requirement:</i>	<i>0.90 Cum</i>	<i>347.33 Kg</i>	<i>0.45 Cum</i>

F RCC M25 (using 20mm & Down Size)

(p) Height upto 5m

(i) Using concrete Mixer Cum 6950.00 6670.00

(ii) With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km. Cum 6210.00 5960.00

(q) Height 5m to 10m

(i) Using concrete Mixer Cum 7170.00 6890.00

(ii) With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km. Cum 6410.00 6150.00

(r) Height above 10m

(i) Using concrete Mixer Cum 7520.00 7210.00

13.5 (ii) With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km. Cum 6710.00 6450.00

<i>Material</i>	<i>Metal</i>	<i>Cement</i>	<i>FA</i>
<i>Requirement:</i>	<i>0.90 Cum</i>	<i>403.33 Kg</i>	<i>0.45</i>

G RCC M30 (using 20mm & Down Size)

(p) Height upto 5m

(i) Using concrete Mixer Cum 6970.00 6690.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
(ii)		With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.	Cum	6230.00	5980.00
(q)		Height 5m to 10m			
(i)		Using concrete Mixer	Cum	7170.00	6880.00
(ii)		With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.	Cum	6410.00	6150.00
(r)		Height above 10m			
(i)		Using concrete Mixer	Cum	7450.00	7150.00
(ii)		With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.	Cum	6660.00	6390.00

<i>Material Requirement:</i>	<i>Metal</i> 0.90 Cum	<i>Cement</i> 406.67 Kg	<i>FA</i> 0.45 Cum
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H RCC M35 (using 20mm & Down Size)

(p)		Height upto 5m			
(i)		Using concrete Mixer	Cum	7090.00	6800.00
(ii)		With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.	Cum	6500.00	6240.00
(q)		Height 5m to 10m			
(i)		Using Concrete Mixer	Cum	7240.00	6950.00
(ii)		With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.	Cum	6640.00	6370.00
(r)		Height above 10m			
(i)		Using Concrete Mixer	Cum	7470.00	7170.00
(ii)		With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.	Cum	6850.00	6580.00

<i>Material Requirement:</i>	<i>Metal</i> 0.90 Cum	<i>Cement</i> 422 Kg	<i>FA</i> 0.45 Cum
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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13.06 1600 & 2200 Providing **TMT Steel** bar reinforcement conforming to IS-1786, designation in substructure including straightening bars, cutting, bending, hooking, binding with approved quality binding wire after placing in position, tying, lapping and / or welding wherever required and anchoring to the adjoining members wherever necessary as per drawing (laps, hooks and wastages shall not be measured and paid) including cost of all materials, bar bending charges, labour, lead lifts etc., complete.

- i) FE-500 Grade
- ii) FE-550 Grade

MT. 70700.00 67900.00
MT. 71300.00 68500.00

<i>Material Requirement:</i>	<i>TMT Steel</i> 1050 Kg	<i>Binding Wire</i> 6.00 Kg
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13.07 1600 & 2200 Providing **Mild Steel** reinforcement conforming to IS-432, S-240 Grade designation as per table 1000-3 in substructure including straightening bars, cutting, bending, hooking, binding with approved quality binding wire after placing in position, tying, lapping and / or welding wherever required and anchoring to the adjoining members wherever necessary as per drawing (laps, hooks and wastages shall not be measured and paid) including cost of all materials, bar bending charges, labour, lifts etc., complete.

MT. 53570.00 51420.00

<i>Material Requirement:</i>	<i>Mild Steel</i> 1050 Kg	<i>Binding Wire</i> 6.00 Kg
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13.08 2706 & 2200 Providing **Weep Holes** in Brick masonry/Plain/ Reinforced concrete abutment, wing wall/ return wall with 110 mm outer dia PVC pipe at 2kg/Sqm, fixing in position using addessive with necessary collar and clamp extending through the full width of the structure with slope of 1V :20H towards drawing force as per drawing including cost of all materials, glue, labour, transportation, lead, lift, loading, etc., unloading complete.

Rmtr 257.00 247.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
13.09	710.1.4.of IRC:78 & 2200	Back filling behind abutment, wing wall, return wall and foundation trenches as per drawing in layers not exceeding 20cms in depth, compacting deposited material by plate compactor/ power rammer after duly watering to achieve the desired degree of compaction, including cost of materials, labour, hire charge of machineries, transportation, lead, lift, loading, unloading etc complete.			
	A	Granular material with all lead	Cum	765.00	735.00
	B	Sandy material with all lead	Cum	3190.00	3060.00
13.10	710.1.4.of IRC:78 & 2200	Providing and laying of Filter media with stone crushed aggregates satisfying the requirements laid down in clause 2504.2.2. to a thickness of not less than 600 mm with smaller size towards the soil and bigger size towards the wall and provided over the entire surface behind abutment, wing wall and return wall to the full height compacted to a firm condition as per drawing including cost of materials, labour, watering, transporting, lead, lift, loading, unloading etc., complete.			
			Cum	1100.00	1050.00
13.11	2000, 1000 & 2200	Supplying, fitting and fixing in position true to line and level Cast Steel Rocker Bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoSRT&H specifications complete including all accessories as per drawing and Technical Specifications.	One tonne capacity	380.00	360.00
13.12	2000 1000 & 2200	Supplying, fitting and fixing in position true to line and level Forged Steel Roller Bearing conforming to IRC: 83(Pt.-1) section IX and clause 2003 of MoSRT&H specifications complete including all accessories as per drawing and Technical Specifications.	One tonne capacity	20.95	20.10

SL No.	Ref. to MoSRT & H Specifications	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
13.06	16		

Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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Supplying, fitting and fixing in position true to line and level **Sliding Plate Bearing with** stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications and as per IRC: 83 (part-II) section IX and clause 2005 of MoSRT&H specifications complete including all accessories as per drawing and Technical Specifications.

One tonne capacity 1185.00 1140.00

13.14 2000 & 2200

Supplying, fitting and fixing in position true to line and level **Sliding Plate Bearing** with stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications.

One cubic centimeter 0.66 0.63

13.15 2000 & 2200

Supplying, fitting and fixing in position true to line and level **Sliding Plate Bearing** with stainless steel plate sliding on stainless steel plate with mild steel matrix complete including all accessories as per drawing and Technical Specifications.

One tonne capacity 1210.00 1165.00

13.16 2000 & 2200

Supplying, fitting and fixing in position true to line and level **POT-PTFE Bearing** consisting of a metal piston supported by a disc or unreinforced elastomer confined within a metal cylinder, sealing rings, dust seals, PTFE surface sliding against stainless steel mating surface, complete assembly to be of cast steel/fabricated structural steel, metal and elastomer elements to be as per IRC: 83 part-I & II respectively and other parts conforming to BS: 5400, section 9.1 & 9.2 and clause 2006 of MoSRT&H Specifications complete as per drawing and Technical Specifications.

One tonne capacity 383.00 368.00

CHAPTER - 14

SUPERSTRUCTURE

Preamble :

1. The rate for the wearing coat has been analysed as under:
 - a) Cement concrete wearing coat
 - b) Ashphaltic concrete wearing coat
 - c) Bitumen mastic wearing coat

The item may be selected as per approved design. In case the thickness of wearing coat is different from that analysed, the rate for the desired thickness may be worked out on pro-rata basis.
2. The rate analysis has been done both for RCC Railing and M.S. Railing, which can be adopted as per approved design.
3. The rate for anti-corrosive treatment is required to be ascertained from firms specialised in this work. In this connection Circular No. RW/NH-34041/44/91-S&R dated 21.3.2000 of Ministry of Shipping, Road Transport and Highways may be referred for further details.
4. Expansion joints involving movements exceeding 40 mm are specialised readymade items commercially produced by reputed firms with imported technology and parts. The rates for such joints are required to be ascertained from the firms pre-qualified by the Ministry.
5. MoSRT&H letter No. RW/NH-34059/1/96 S&R dated 30.11.2000 and subsequent corrigendum dated 25.1.2001 may be referred for detailed specifications and provisions for various types of expansion joints.
6. Supply of new type of expansion joint may be obtained on the basis of competitive bidding from amongst the suppliers pre-qualified by the Ministry of Shipping, Road Transport and Highways. Further, a warranty of 10 years of trouble free performance may be, insisted from the suppliers.
7. For bridges having wide deck/span length of more than 120 m or / and involving complex movements / rotations in different directions / planes, provision of special type of modular expansion joints such as swivel joists joints are required for which firms specialised in this field may be consulted. Such cases will require prior approval of Ministry.
8. RCC mix design to be got approved with minimum cement constant mention in this chapter are to be maintained.

Sl. No.	
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Sl. No.	Ref. to MoSRI Specification	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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Bridge W

14 URE

ed as under:

13.14 2000
& 2200

case the thickness
for the desired
M.S. Railing,

13.15 2000
& 2200

ained from
No. RW/
g, Road

13.16 2000

alised
with
ed

er-structure

Cum 7080.00 6790.00
Cum 7370.00 7080.00
Cum 7670.00 7360.00

5m
5m to 10m
Height above 10m

For T-beam & Slab

- (p) Height upto 5m
- (q) Height 5m to 10m
- (r) Height above 10m

Cum 7370.00 7080.00
Cum 7670.00 7360.00
Cum 7960.00 7640.00

- (b) With Batching Plant, Transit Mixer &

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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Concrete Pump with lead of mix upto 1km.**(i) For solid slab super-structure**

(p)	Height upto 5m	Cum	6270.00	6020.00
(q)	Height 5m to 10m	Cum	6530.00	6270.00
(r)	Height above 10m	Cum	6790.00	6520.00

(ii) For T-beam & slab

(p)	Height upto 5m	Cum	6530.00	6270.00
(q)	Height 5m to 10m	Cum	6790.00	6520.00
(r)	Height above 10m	Cum	7050.00	6770.00

<i>Material Requirement:</i>	<i>Metal 0.90 Cum</i>	<i>Cement 341.33 Kg</i>	<i>FA 0.45 Cum</i>
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14.01 B RCC M25**(a) Using Concrete Mixer****(i) For solid slab super-structure**

(p)	Height upto 5m	Cum	7550.00	7240.00
(q)	Height 5m to 10m	Cum	7860.00	7550.00
(r)	Height above 10m	Cum	8180.00	7850.00

(ii) For T-beam & slab

(p)	Height upto 5m	Cum	7860.00	7550.00
(q)	Height 5m to 10m	Cum	8180.00	7850.00
(r)	Height above 10m	Cum	8490.00	8150.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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(b) With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.

(i) For solid slab super-structure

(p) Height upto 5m

Cum 6750.00 6480.00

(q) Height 5m to 10m

Cum 7030.00 6750.00

(r) Height above 10m

Cum 7310.00 7020.00

(ii) For T-beam & slab

(p) Height upto 5m

Cum 7030.00 6750.00

(q) Height 5m to 10m

Cum 7310.00 7020.00

(r) Height above 10m

Cum 7590.00 7290.00

Material Requirement:	Metal 0.90 Cum	Cement 399.33 Kg	FA 0.45
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14.01 C

RCC M 30

(a) Using Concrete Mixer

(i) For solid slab super-structure

(p) Height upto 5m

Cum 7650.00 7350.00

(q) Height 5m to 10m

Cum 7970.00 7650.00

(r) Height above 10m

Cum 8290.00 7960.00

(ii) For T-beam & slab

(p) Height upto 5m

Cum 7970.00 7650.00

(q) Height 5m to 10m

Cum 8290.00 7960.00

(r) Height above 10m

Cum 8610.00 8270.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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(b) **With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.**

(i) **For solid slab super-structure**

(p)	Height upto 5m	Cum	6820.00	6550.00
(q)	Height 5m to 10m	Cum	7100.00	6820.00
(r)	Height above 10m	Cum	7390.00	7090.00

(ii) **For T-beam & slab**

(p)	Height upto 5m	Cum	7100.00	6820.00
(q)	Height 5m to 10m	Cum	7390.00	7090.00
(r)	Height above 10m	Cum	7670.00	7360.00

<i>Material Requirement:</i>	<i>Metal 0.90 Cum</i>	<i>Cement 406.67 Kg</i>	<i>FA 0.45 Cum</i>
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14.01 D RCC/PSC M35

(a) **Using Concrete Mixer.**

(i) **For solid slab super-structure**

(p)	Height upto 5m	Cum	7650.00	7340.00
(q)	Height 5m to 10m	Cum	7970.00	7650.00
(r)	Height above 10m	Cum	8300.00	7960.00

(ii) **For T-beam & slab**

(p)	Height upto 5m	Cum	7970.00	7650.00
(q)	Height 5m to 10m	Cum	8300.00	7960.00
(r)	Height above 10m	Cum	8620.00	8280.00

to Specification		Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
14.01	D(a) (iii)	For box girder and balanced cantilever			
	(p)	Height upto 5m	Cum	8940.00	8590.00
	(q)	Height 5m to 10m	Cum	9590.00	9210.00
	(r)	Height above 10m	Cum	10240.00	9830.00
	(b)	With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.			
(i)		For solid slab super-structure			
	(p)	Height upto 5m	Cum	6810.00	6540.00
	(q)	Height 5m to 10m	Cum	7100.00	6820.00
	(r)	Height above 10m	Cum	7390.00	7100.00
(ii)		For T-beam & slab			
	(p)	Height upto 5m	Cum	7100.00	6820.00
	(q)	Height 5m to 10m	Cum	7390.00	7100.00
	(r)	Height above 10m	Cum	7680.00	7370.00
(iii)		For box girder and balanced cantilever			
	(p)	Height upto 5m	Cum	7970.00	7650.00
	(q)	Height 5m to 10m	Cum	8550.00	8210.00
	(r)	Height above 10m	Cum	9130.00	8760.00

<i>Material Requirement:</i>	<i>Metal</i> 0.90 Cum	<i>Cement</i> 422.00 Kg	<i>FA</i> 0.45 Cum
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
14.01	E	<u>PSC M-40</u>			
	(a)	Using Concrete Mixer.			
	(i)	For solid slab super-structure			
	(p)	Height upto 5m	Cum	8080.00	7760.00
	(q)	Height 5m to 10m	Cum	8420.00	8080.00
	(r)	Height above 10m	Cum	8760.00	8410.00
	(ii)	For T-beam & slab			
	(p)	Height upto 5m	Cum	8420.00	8080.00
	(q)	Height 5m to 10m	Cum	8760.00	8410.00
	(r)	Height above 10m	Cum	9090.00	8730.00
	(b)	With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.			
	(i)	For solid/voided slab super-structure			
	(p)	Height upto 5m	Cum	7050.00	6770.00
	(q)	Height 5m to 10m	Cum	7350.00	7060.00
	(r)	Height above 10m	Cum	7650.00	7340.00
	(ii)	For T-beam & slab			
	(p)	Height upto 5m	Cum	7350.00	7060.00
	(q)	Height 5m to 10m	Cum	7650.00	7340.00
	(r)	Height above 10m	Cum	7950.00	7630.00

Description	Unit	Rate Rs.	Rate Rs.
		Major Bridge Cat-I	Minor Bridge Cat-II

box girder, segment
and balanced cantilever

Cum 8250.00	7920.00
Cum 8850.00	8490.00
Cum 9440.00	9070.00

Height upto 5m
Height 5m to 10m
Height above 10m

Material Requirement:	Metal	Cement	FA
	0.90 Cum	430.00 Kg	0.45 Cum

PSC M-45

With Batching Plant, Transit Mixer &
Concrete Pump with lead of mix upto 1km.

For solid slab/voided slab super-structure

(i)

- (p) Height upto 5m
- (q) Height 5m to 10m
- (r) Height above 10m

Cum 7220.00	6930.00
Cum 7530.00	7230.00
Cum 7840.00	7530.00

(ii)

For T-beam & slab including launching of
precast girders by launching truss upto 40 m
span

- (p) Height upto 5m
- (q) Height 5m to 10m
- (r) Height above 10m

Cum 7530.00	7230.00
Cum 7840.00	7530.00
Cum 8160.00	7830.00

(iii)

For cast-in-situ box girder, segmental
construction and balanced cantilever

- (p) Height upto 5m
- (q) Height 5m to 10m
- (r) Height above 10m

Cum 8470.00	8130.00
Cum 9090.00	8730.00
Cum 9710.00	9320.00

Material Requirement:	Metal	Cement	FA
	0.90 Cum	465.00 Kg	0.45 Cum

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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14.01 G

PSC M-50

With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.

(i) For cast-in-situ box girder, segmental construction and balanced cantilever

(p)	Height upto 5m	Cum	8640.00	8300.00
(q)	Height 5m to 10m	Cum	9280.00	8910.00
(r)	Height above 10m	Cum	9920.00	9530.00

<i>Material Requirement:</i>	<i>Metal</i> 0.90 Cum	<i>Cement</i> 490.00 Kg	<i>FA</i> 0.45 Cum
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14.01 H

PSC M-55

With Batching Plant, Transit Mixer & Concrete Pump with lead of mix upto 1km.

(i) For cast-in-situ box girder, segmental construction and balanced cantilever

(p)	Height upto 5m	Cum	9020.00	8660.00
(q)	Height 5m to 10m	Cum	9690.00	9300.00
(r)	Height above 10m	Cum	10360.00	9940.00

<i>Material Requirement:</i>	<i>Metal</i> 0.90 Cum	<i>Cement</i> 529.17 Kg	<i>FA</i> 0.45 Cum
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14.02 1600

Providing TMT Steel bar reinforcement conforming to IS-1786, designation in superstructure including straightening bars, cutting, bending, hooking, binding with approved quality binding wire after

tion	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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ing and / or
anchoring
herever
hooks
and
materials, bar
etc., complete.

MT.	72400.00	69500.00
MT.	73000.00	70000.00

MT Steel	Binding Wire
1050 Kg	8.00 Kg

Providing and laying **RCC Wearing Coat**
M-30 grade as per drawing using granite
/ trap / basalt aggregates of 20mm and
down size using clean sieved approved
fine aggregate or duple washed crushed
metal sand mixing mechanically carriage
by transit mixer and laying by concrete
pump, formwork, curing, fabrication of
reinforcement including the cost of steel and
all other materials, hire charges of machinery,
labour, lead, lifts, loading, unloading
etc., complete.

Cum 11200.00 10750.00

Material	Metal	Cement	FA	TMT
Requirement:	0.90 Cum	406.67 Kg	0.45 Cum	78.75 Kg

14.05 516 & 2702

Mastic Asphalt

Providing and laying 12 mm thick **mastic asphalt**
wearing course excluding tack coat with VG-40
Complying with IS.73-2013 (Industrial grade
Bitumen) at an average of 15.50% bitumen coarse
aggregate, fine aggregate and hydrated lime stone
dust as filler, meeting the requirements given in
table 500-39, 500-40, 500-41, 500-42 prepared by
using mastic cooker and laid to required level and
slope after cleaning the surface with Mechanical
broom & dusting with Air compresor, including
providing antiskid surface with VG-30 grade

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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bitumen precoated hard stone chipping of 13.2 mm nominal size at the rate of 0.005cum/10 sqm and at an approximate spacing of 10 cm center to center in both directions, pressed into surface when the temperature of surface is not less than 100 Degrees, protruding 1 mm to 4 mm over mastic surface, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading, stacking, transporting, etc complete, except lead for Bitumen.

Sqm 375.00 360.00

<i>Material Requirement:</i>	<i>Metal</i> 0.0134Cum	<i>Bitumen VG-40</i> 4.27 Kg	<i>Bitumen VG-30</i> 0.0145 Kg	<i>Lime Filler</i> 4.96 Kg
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- Note**
1. The rates for 50 mm & 40 mm thick layers may be worked out on pro-rate basis.
 2. Selection of grade of bitumen may be done as per the site condition. The difference in cost of bitumen may be added/subtracted.

14.06 2703, 1500,
1600 & 1700

Construction of **Precast RCC Railing** of M30 Grade, using granite / trap / basalt aggregates of size not exceeding 12 mm and down and clean sieved approved fine aggregate or double washed crushed metal sand mixing mechanically, laying true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawing No. SD - 202 including cost of all materials, labour, form work, cost of steel and fabrication charges, casting, handling, transporting, loading, unloading, lead, lifts, fixing in position etc., complete.

Rmtr 1900.00 1820.00

<i>Material Requirement:</i>	<i>Metal</i> 0.076 Cum	<i>Cement</i> 34.66 Kg	<i>FA</i> 0.038 Cum	<i>TMT</i> 18.13 Kg
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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14.07	2703, 1500, 1600 & 1700	Construction of RCC Railing of M30 Grade in-situ using granite / trap / basalt aggregates of size not exceeding 12 mm and down and clean sieved approved fine aggregate or double washed crushed metal sand mixing in concrete mixer true to line and grade, tolerance of vertical RCC post not to exceed 1 in 500, centre to centre spacing between vertical post not to exceed 2000 mm, leaving adequate space between vertical post for expansion, complete as per approved drawing No. SD - 202 including cost of all materials, labour, form work, cost of steel and fabrication charges, casting, handling, transporting, loading, unloading, lead, lifts, fixing in position etc., complete.		Rmtr 1840.00	1770.00
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<i>Material Requirement:</i>	<i>Metal</i> 0.076 Cum	<i>Cement</i> 34.66 Kg	<i>FA</i> 0.038 Cum	<i>TMT</i> 18.13 Kg
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14.08	2703.2 & 1900	Providing Mild Steel Railing as per Drawing No. BD/1-88 using ISMC 100, MS flat, MS bars, bolts, nuts, and washers for fixing, painting three coats of synthetic enamel paint over one shop coat with red oxide painting fixing in position by welding and drilling equipments, in concrete including cost of all materials, conveyance charges, labour, welding charges etc., complete.		Rmtr 2770.00	2660.00
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<i>Material Requirement:</i>	<i>Mild Steel</i> 42.88 kg
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14.09	2705	Providing Drainage Spouts using 100mm dia G.I. Pipe one metre long & (260 x 260) mm M.S. grating as per drawing, fabricating, fixing in position, painting with anti-corrosive/bituminous paint, including cost of all materials, labour, lead, lifts etc., complete.		Each 422.00	405.00
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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14.10	2700	Providing Plain cement concrete M 15 ordinary grade Levelling Course below approach slab using 40mm and down size granite/trap/basalt coarse aggregates and clean sieved approved fine aggregate or dumble washed crushed metal sand mechanically mixed by concrete mixer, laying, vibrating, curing, cost of all materials, labour, loading, unloading, lead, lift, hire charges of machinery etc., complete.		Cum 5360.00	5140.00
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<i>Material Requirement:</i>	<i>Metal</i> 0.90 Cum	<i>Cement</i> 275.33 Kg	<i>FA</i> 0.45 Cum
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14.11	1500,1600, 1700 & 2704	Providing and laying Reinforced Cement Concrete Approach Slab , using M 30 grade as per drawing using 20mm and down size granite/trap/basalt coarse aggregates and clean sieved approved fine aggregate or dumble washed crushed metal sand mechanically mixed by Batch mix plant, fabrication of reinforcements including cost of all materials, labour, steel, fabrication charges, formwork, curing, loading, unloading, lead, lift, etc., complete.		Cum 9400.00	9020.00
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<i>Material Requirement:</i>	<i>Metal</i> 0.90 Cum	<i>Cement</i> 406.67 Kg	<i>FA</i> 0.45 Cum	<i>TMT</i> 52.50 Kg
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14.13 **Precast - pretensioned Girders**

Providing, Precasting - pretensioned M-40 Grade concrete Girders, as per design, drawing using granite / trap / basalt aggregates of 20mm and down size using clean sieved approved fine aggregate or dumble washed crushed metal sand mixing mechanically carriage by transit mixer and laying by concrete pump, formwork, curing, fabrication of reinforcement including the cost of steel and all other materials, hire charges of machinery,

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
		transportation and placing in position precast as per drawing and technical specifications including Labour for (i) Cutting, bending, making reinforcement cage, placing in position, binding etc. complete (ii) Cable cutting and threading in position including binding by insulation tape with HDPE pipes etc., prestressing and cutting of extra length of HT strand after de-stressing. (iii) Erection and dismantling of shuttering (iv) Concreting mixing mechanically and stationary concrete pump (v) Steam curing / manual curing (vi) Handling of precast concrete girder, stacking in stockyard and again loading in trailer (vii) Placement of girders in position over pier caps including placement of sand jacks, channel, levelling etc. transportation and placement at site, including cost of all materials, labour, lead, lift, load, unload, hire charges of all machineries, transportation, placing in position, curing, as per specifications clause 1800 & 2300 complete.	Cum	24000.00	23100.00
14.16	800	Painting on concrete surface Providing and applying 2 coats of water based cement paint to unplastered concrete surface after cleaning the surface of dirt, dust, oil, grease, efflorescence and applying paint @ 1 litre for 2 sqm including cost & conveyance of all materials, labour lead, lifts etc complete.	Sqm	70.00	67.00
14.17	2600	Burried Joint Providing and laying burried expansion joint, expansion gap being 20 mm, covered with 12 mm thick, 200 mm wide galvanised weldable structural steel plate as per IS: 2062, placed symmetrical to centre line of the joint, resting freely over the top surface of the deck concrete, welding of 8 mm dia. 100 mm long galvanised nails spaced 300 mm c/c along the centre line of the plate, all as specified in clause 2604 including cost			

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
		& conveyance of all materials, labour lead, lifts etc complete.	Rmtr	1190.00	1140.00
Note Guidelines laid down vide MoSRT&H circular No. RW/NH-34059/1/96-S & R Dated 30-11-2000 and subsequent corrigendum Dated 25-01-2001 may be referred for expansion joints.					
14.18	2604	Filler joint			
	(i)	Providing & fixing 2 mm thick corrugated copper plate in expansion joint including cost & conveyance of all materials, labour, fixing in position, etc., complete as per drawing	Rmtr	2620.00	2520.00
	(ii)	Providing & fixing 20 mm thick compressible fibre board in expansion joint complete including cost & conveyance of all materials, labour, fixing in position, etc., complete as per drawing.	Rmtr per cm height	5.05	4.85
	(iii)	Providing and fixing in position 20 mm thick premoulded joint filler in expansion joint for fixed ends of simply supported spans not exceeding 10 m to cater for a horizontal movement upto 20 mm, covered with sealant including cost & conveyance of all materials, labour, fixing in position, complete as per drawing.	Rmtr per cm height	7.80	7.45
	(iv)	Providing and filling joint sealing compound as per drawings with coarse sand and 6 per cent bitumen by weight (0.083 Kg/m Bitumen) including cost and conveyance of all materials, labour, lead and lifts, etc complete.	Rmtr	35.30	33.80

Sl. No.	Ref. to MoSRT & H Specification	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
Rmtr	1190.00	1140.00

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ang/backer rod, all as per
ings and specifications using
ker including cost and conveyance of
aterials, labour, lead and lifts etc., complete.

Rmtr 980.00 940.00

Compression Seal Joint

Providing and laying of compression seal joint consisting of steel structure as per IS 2062 armoured nosing at two edges of the joint gap suitably anchored to the deck concrete and a preformed chloroprene elastomer or closed cell foam joint sealer compressed with high tear strength vulcanised for full length of joint to ensure water tightness and fixed into the joint gap with special adhesive binder to cater for a horizontal movement upto 40 mm and vertical movement of 3mm including cost and conveyance of all materials, labour, lead, lifts etc complete. to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.

Rmtr 17500.00 16800.00

14.22 2606, 2607 Strip Seal Expansion Joint

Providing and laying of a strip seal expansion joint catering to maximum horizontal movement upto 70 mm including cost and

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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conveyance of all materials, labour and fabrication cost and machinery inputs for various processing operations for mild steel members, welding of anchor strips to anchor plates etc., complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.

Rmtr 14700.00 14100.00

14.23 2607

Modular Strip / Box Seal Joint

Providing and laying of a modular strip Box seal expansion joint including anchorage catering to a horizontal **movement beyond 70 mm and upto 140mm** including cost and conveyance of all materials, labour, fabrication cost, machinery inputs for various processing operations for mild steel members, welding of anchor strips to anchor plates etc., complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.

Rmtr 6570.00 6330.00

14.24 2607

Modular Strip / Box Seal Joint

Providing and laying of a modular strip box seal expansion joint catering to a horizontal **movement beyond 140mm and upto 210mm** including cost and conveyance of all materials, labour and fabrication cost and machinery inputs for various processing operations for mild steel members, welding of anchor strips to anchor plates etc., complete as per approved drawings and standard specifications to be installed by the manufacturer/supplier or their authorised representative ensuring compliance to the manufacturer's instructions for installation.

Rmtr 8060.00 7740.00

CHAPTER - 15

RIVER TRAINING AND PROTECTION WORKS

Preamble :

1. Three types of aprons on river bed as under have been catered.
 - a) Boulder apron laid dry
 - b) Boulder apron laid in wire crates
 - c) Apron laid in cement concrete blocks on M15
2. Toe wall for toe protection of pitching can be either in dry rubble masonry (uncoursed) or in nominal mix cement concrete M15. Depending upon the design, the rates may be adopted under respective clauses.
3. Flooring has been proposed in dry rubble stone, rubble stone laid in C M1:3 and with cement concrete blocks M-15.
4. Curtain walls proposed are of following two types:
 - a) Course rubble stone masonry (1st sort) in C.M. 1:3.
 - b) Cement concrete M-15 grade..
5. The rate analysis for gabian structures comprising of stone boulders laid in wire crates have been included. Such structures are suited as retaining structures and for erosion control in river training work especially for situations where some settlement of foundation is anticipated. These structures can adjust in minor settlements, being flexible structures, without losing their functional requirement.

CHAPTER-15

RIVER TRAINING AND PROTECTION WORKS

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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15.01	2503	Providing and laying boulders laid dry without wire crates for Apron on river bed for protection against scour with stone boulders weighing not less than 40 kg each complete as per drawing, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Cum	1180.00	1130.00
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15.02	2503	Providing and laying of Boulder Apron Laid in Wire Crates made with 4mm dia GI wire conforming to IS: 280 & IS:4826 in 100mm x 100mm mesh (weaved diagonally) including 10 per cent extra for laps and joints laid with stone boulders weighing not less than 40 kg each complete as per drawing, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Cum	1810.00	1740.00
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15.03	2503	Cement Concrete Blocks (size 0.5 x 0.5 x 0.5 m) including hire charges of machineries. Providing and laying of Apron with Cement Concrete Blocks of size 0.5x0.5x0.5 m cast in-situ and made with nominal mix of M-15 grade cement concrete using granite / Trap / basalt coarse aggregates and clean sieved approved fine aggregate or double washed crushed metal sand mechanically mixed in concrete mixer as per IRC: 21-2000, complete as per drawing, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.	Cum	5680.00	5460.00
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<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	275.33 Kg	0.45 cum	0.90 Cum

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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15.04 2504

Providing and laying **Pitching on Slopes** laid over existing prepared filter media including boulder apron laid dry in front of toe of embankment complete as per drawing, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

A Stone/Boulder

Cum 1180.00 1130.00

B Cement Concrete Blocks of size 0.3x0.3 x0.3 m cast in cement concrete of Grade M15 including hire charges of machineries.

Cum 5680.00 5460.00

<i>Material Requirement:</i>	<i>Cement</i> 275.33 Kg	<i>FA</i> 0.45 cum	<i>Metal</i> 0.90 Cum
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15.05 2504

Providing and laying **Filter material** as per table 300-3 underneath pitching in slopes complete as per drawing, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Cum 1365.00 1310.00

15.08 2505

Providing and laying **Flooring** laid over cement concrete bedding of 100mm thickness complete as per drawing, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

A Rubble stone laid in cement mortar 1:3

Cum 5150.00 4990.00

<i>Material Requirement:</i>	<i>Cement</i> 259.15 Kg	<i>FA</i> 0.46 Cum	<i>Metal</i> 0.297 Cum	<i>Stone</i> 1.20 Cum
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B Cement Concrete blocks Grade M15

including hire charges of machineries.

Cum 7490.00 7190.00

<i>Material Requirement:</i>	<i>Cement</i> 678.30 Kg	<i>FA</i> 0.598 Cum	<i>Metal</i> 1.197Cum
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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15.09 2506 Dry Rubble Flooring

Providing and laying **Dry Rubble Flooring** at cross drainage works for relatively less important works complete as per drawing, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Cum 1740.00 1670.00

15.10 2507.2 A Providing and **construction of Curtain wall using granite/trap/basalt rubble masonry** in C.M.1:3 using clean sieved approved fine aggregate or duple washed crushed metal sand mixed in concrete mixer in courses not less than 15 cms high, bond stones at 2 Mts apart in each course as per Drawing including scaffolding, formwork, curing, cost of all materials, labour, hire charges of machinery, lead, lift, loading, unloading, transporting, stacking etc., complete.

Cum 5560.00 5340.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Stone</i>
<i>Requirement:</i>	158.10 Kg	0.325 Cum	1.257 Cum

15.10 B Providing and **Construction of Curtain wall in Cement concrete Grade M15** using granite/trap/basalt coarse aggregates in C.M.1:3 using clean sieved approved fine aggregate or duple washed crushed metal sand mixed in concrete mixer complete as per drawing, including cost of all materials, labour, hire charges of machineries, loading, unloading, lead, lift, transporting etc., complete.

Cum 5570.00 5350.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	275.33 Kg	0.45 Cum	0.90 Cum

15.11 2507.2 Flexible Apron :Construction of flexible apron 1m thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall, complete as per drawing, including cost of all

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Major Bridge Cat-I	Rate Rs. Minor Bridge Cat-II
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materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Cum 1280.00 1230.00

Material Requirement:	Stone 1.20 Cum
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15.12 2503.3

Gabian Structure for Retaining Earth

Providing and construction of a gabian structure for retaining earth with segments of wire crates of size 7 m x 3 m x 0.6 m each divided into 1.5 m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg/10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be tied with 4 mm galvanised steel wire, complete as per drawing, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Cum 1860.00 1790.00

15.13 2503.3

Gabian Structure for Erosion Control, River Training Works and Protection works

Providing and constructing gabian structures for erosion control, river training works and protection works with wire crates of size 2 m x 1 m x 0.3 m each divided into 1m compartments by cross netting, made from 4 mm galvanised steel wire @ 32 kg per 10 sqm having minimum tensile strength of 300 Mpa conforming to IS:280 and galvanizing coating conforming to IS:4826, woven into mesh with double twist, mesh size not exceeding 100 mm x 100 mm, filled with boulders with least dimension of 200 mm, all loose ends to be securely tied with 4 mm galvanised steel wire, complete as per drawing, including cost of all materials, labour, loading, unloading, lead, lift, transporting etc., complete.

Cum 3140.00 3010.00

CHAPTER - 16

REPAIR AND REHABILITATION

Preamble :

1. Removal of cement concrete wearing coat and asphaltic wearing coat has been proposed with pneumatic breakers.
2. Sealing of cracks has been proposed with cement grout, cement mortar (1:1) grout and epoxy injecting with grout pump through nipples.
3. Bonding of new concrete with old concrete is proposed with epoxy resin.

CHAPTER-16

REPAIR AND REHABILITATION

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.
16.01	2811	Removal of existing cement concrete wearing coat using air compressor with pneumatic breaker and tractor trolley including its disposal complete without causing any detrimental effect to any part of the bridge structure and removal of dismantled material with lead upto 1000 m including cost of all labour, hire charges of machinery, lift, loading, unloading etc., complete. (Thickness 75 mm)	Sqm	116.00	
16.02	2811	Removal of existing asphaltic wearing coat comprising of 50 mm thick asphaltic concrete laid over 12 mm thick mastic asphalt using air compressor with pneumatic breaker and tractor trolley including disposal with lead upto 1000m including cost of all labour, hire charges of machinery, lift, loading, unloading etc., complete.	Sqm	87.00	
16.03	2807	Guniting concrete surface with wire mesh 50x50x3mm & cement mortar with super plasticiser admixture is marked as per 9103-1999, applied with air compressor with guniting equipment along with all accessories after cleaning surface and spraying with epoxy complete, including cost of all materials, labour, hire charges of machinery, all lead, lifts, loading, unloading etc., complete.	Sqm	680.00	
16.04	2800	Providing and inserting nipples with approved fixing compound after drilling holes for grouting including subsequent cutting/removal and sealing of the hole as necessary of nipples after completion of grouting with Cement/Epoxy, including cost of all materials, labour, lead, lifts, loading, unloading etc., complete.	Each	153.00	
16.05	2806	Sealing of cracks/porous concrete by injection process through nipples/Grouting using grout pump with agitator with accessories complete, including			

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		cost of admixture, all materials, labour, hire charges of machinery, lead, lifts, loading, unloading etc., complete.		
	A	Cement Grout	Kg	215.00
	B	Cement Mortar (1:1) Grouting	Kg	211.00
16.06	2800	Patching of damaged concrete surface with polymer concrete and curing compounds, initiator and promoter, available in present formulations, to be applied as per instructions of manufacturer and as approved by the Engineer in charge, including cost of all materials, labour, hire charges of Machinery, lead lifts, loading, unloading etc., complete	Sqm	7800.00
16.07	2803	Sealing of crack / porous concrete with Epoxy Grout by injection through nipples using epoxy injection gun complete, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading etc., complete.	Kg	470.00
16.08	2804	Applying epoxy mortar overleached, honey combed and spalled concrete surface and exposed steel reinforcement complete, including cost of all materials, labour, lead, lifts, loading, unloading etc., complete. (@10mm thickness)	Sqm	490.00
16.09	2807	Removal of defective concrete, cleaning the surface thoroughly, applying the shotcrete mixture mechanically with compressed air under pressure, comprising of cement, fine aggregate or duple washed crushed metal sand, coarse aggregates, water and quick setting compound in the proportion as per clause 2807.1., fine aggregate or duple washed crushed metal sand and coarse aggregates conforming to IS: 383 and table 1 of IS: 9012 respectively, water cement ratio ranging		

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
		from 0.35 to 0.50, density of gunite not less than 2000 kg/cum, strength not less than 25 Mpa and workmanship conforming to clause 2807.6, including cost of all materials, labour, hire charges of machinery, lead, lifts, loading, unloading etc., complete.	Sqm	320.00
16.10	2804	Applying pre-packed cement based polymer mortar of strength 45 Mpa at 28 days for replacement of spalled concrete as directed by Engineer in Charge, including cost of all materials, labour, hire charges of Machinery, lead lifts, loading, unloading etc., complete	Sqm	430.00
16.11	2805	Epoxy bonding of new concrete to old concrete, including cost of all materials, labour, lead, lifts, loading, unloading etc., complete.	Sqm	740.00
16.12	2812	Providing external prestressing with high tensile steel wires/strands including drilling for passage of pre-stressing steel, all acceries for stressing operation and grouting, sealing the anchorage with suitable epoxy mortar after stressing of cables with minimum cover not less than 50mm, ensuring that no part of exisiting structure is damaged / distressed due to external pressuring, removal of existing expansion joints , testing, careful monitoring of deflections of girders, care should be taken to plan the execution of repair work in short possible period, including site welding / riviting / bolt connections, operation of Jacks, providing suitable signages temporarily, safety precutions, curring, including cost of all materials labour, hire charges of Machineries, lead lift, loading, unloading, etc., complete, for satisfactory completion of work as per drawing and technicl specifaicaons. for span upto 25.00 Mtrs, using Cables 4 Nos and 8Nos of Anchorages.	MT	420000.00

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.
16.13	2812	Providing external prestressing with high tensile steel wires/strands including drilling for passage of pre-stressing steel, all acceries for stressing operation and grouting, sealing the anchorage with suitable epoxy mortar after stressing of cables with minimum cover not less than 50mm, ensuring that no part of exisiting structure is damaged / distressed due to external pressuring, removal of existing expansion joints , testing, careful monitoring of deflections of girders, care should be taken to plan the execution of repair work in short possible period, including site welding / riviting / bolt connections, operation of Jacks, providing suitable signages temporarily, safety precutions,curring, incliuding cost of all materials labour, hire charges of Machineries, lead lift, loading, unloading, etc., complete, for satisfactory completion of work as per drawing and technicl specificaions. for span 25.00 Mtrs to 50.00 Mtrs, sing Cables 4 Nos and 8 Nos of Anchorages.	MT	310000.00	

16.14	2812	Providing external prestressing with high tensile steel wires/strands including drilling for passage of pre-stressing steel, all acceries for stressing operation and grouting, sealing the anchorage with suitable epoxy mortar after stressing of cables with minimum cover not less than 50mm, ensuring that no part of exisiting structure is damaged / distressed due to external pressuring, removal of existing expansion joints , testing, careful monitoring of deflections of girders, care should be taken to plan the execution of repair work in short possible period, including site welding / riviting / bolt connections, operation of Jacks, providing suitable signages temporarily, safety precutions,curring, including cost of all materials labour, hire charges of Machineries, lead lift, loading, unloading, etc.,			
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Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate	
				Rs.	Ps.

complete, for satisfactory completion of work as per drawing and technical specifications. **for span 50.00 Mtrs to 100.00 Mtrs, using Cables 6 Nos and 12 Nos of Anchorages.**

MT 265000.00

16.15 2810

Replacement of Bearings complete as per Technical Specification

Lifting of superstructure span by jacking up from below i.e. by placing the jacks of minimum capacity 40 tonne on pier/abutment caps for span length of 30m, , The jacks employed by suitable locations, of required numbers and of suitable sizes shall be selected in such a manner, so that no undue stress are allowed on the existing structure. The methodology should to be got approved for lifting of superstructure. all jacks are to be operated by one control / panel by a single control lever. The jacks should be so synchronised that differential lifts between individual jacks shall not be exceed by 1 mm. Then care should be taken to plan the execution of repair in short period **including cost of bearing & accessories all materials**, labour, hire charges of Machinery, lead lifts, loading, unloading, for successful completion of work, etc., complete, as directed by the Engineer incharge.

No 106000.00

16.16 2810

Rectification of Bearings as per Technical Specifications

Lifting of superstructure span by jacking up from below i.e. by placing the jacks of minimum capacity of 40 tonne on pier/abutment caps for span length of 30m, The jacks employed by suitable locations, of required numbers and of suitable sizes shall be selected in such a manner so that no undue stress are allowed on the existing structure. The methodology should to be got approved for lifting

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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of superstructure. all jacks are to be operated by one control / panel by a single control lever. The jacks should be so synchronised that differential lifts between individual jacks shall not be exceed by 1 mm. Then care should be taken to plan the execution of repair in short period including cost of all materials, (**excluding cost of bearings**) labour, hire charges of Machinery, lead lifts, loading, unloading, etc., complete, for succesful completion of work, as directed by Engineer in Charge.

No 9830.00

16.17

Replacement of Expansion Joints using CC M-30 including removal of old expansion joint, breaking of concrete, cutting of ligs and shifting of broken materials etc., complete as per drawings, cost of materials, labour, lead, lifts, loading, unloading etc., complete.

Rmtr 2655.00

<i>Material</i>	<i>Cement</i>	<i>FA</i>	<i>Metal</i>
<i>Requirement:</i>	<i>122 .00 Kg</i>	<i>0.135 Cum</i>	<i>0.270 Cum</i>

16.18

Replacement of Damaged Concrete Railing and disposal of dismantled material, including cost of materials, labour, hire charges of machinery, lead, lifts, loading, unloading etc., complete.

Rmtr 340.00

16.19

Replacement of Crash Barrier and disposal of dismantled material, including cost of materials, labour, hire charges of machinery, lead, lifts, loading, unloading etc., complete.

Note: (scrap material to be stocked in accountatable manner and disposed)

Rmtr 650.00

16.20

Replacement of Damaged Mild Steel Railing and disposal of dismantled material, including cost of

Sl. No.	Ref. to MoSRT & H Specification	Description	Unit	Rate Rs. Ps.
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of superstructure. all jacks are to be operated by one control / panel by a single control lever. The jacks should be so synchronised that differential lifts between individual jacks shall not be exceed by 1 mm. Then care should be taken to plan the execution of repair in short period including cost of all materials, **(excluding cost of bearings)** labour, hire charges of Machinery, lead lifts, loading, unloading, etc., complete, for succesful completion of work, as directed by Engineer in Charge.

No 9830.00

16.17

Replacement of Expansion Joints using CC M-30 including removal of old expansion joint, breaking of concrete, cutting of ligs and shifting of broken materials etc., complete as per drawings, cost of materials, labour, lead, lifts, loading, unloading etc., complete.

Rmtr 2655.00

<i>Material Requirement:</i>	<i>Cement</i> 122 .00 Kg	<i>FA</i> 0.135 Cum	<i>Metal</i> 0.270 Cum
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16.18

Replacement of Damaged Concrete Railing and disposal of dismantled material, including cost of materials, labour, hire charges of machinery, lead, lifts, loading, unloading etc., complete.

Rmtr 340.00

16.19

Replacement of Crash Barrier and disposal of dismantled material, including cost of materials, labour, hire charges of machinery, lead, lifts, loading, unloading etc., complete.

Note: (scrap material to be stocked in accounatable manner and disposed)

Rmtr 650.00

16.20

Replacement of Damaged Mild Steel Railing and disposal of dismantled material, including cost of

Sl. No.	Ref. to MoSRT Specif	Rate Rs. Ps.
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Description	Unit	Rate Rs. Ps.
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your, hire charges of machinery, lead, unloading etc., complete. Rmtr 280.00

h Barrier

Concrete crash barrier with cement concrete of M-30 grade by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, applying cement concrete after erection of proper form work, and disposal of dismantled material, including cost of materials, labour, hire charges of machinery, lead, lifts, loading, unloading etc., complete. Rmtr 210.00

16.22

Repair of RCC Railing

Carrying out repair of RCC M30 railing to bring it to the original shape, by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, applying cement concrete after erection of proper form work, reinforcements and disposal of dismantled material, including cost of materials, labour, hire charges of machinery, lead, lifts, loading, unloading etc., complete. Rmtr 130.00

16.23

Repair of Steel Railing

Repair of steel railing to bring it to the original shape by cutting and trimming the damaged portion to a regular shape, cleaning the area to be repaired thoroughly, and disposal of dismantled material, including cost of materials, labour, hire charges of machinery, lead, lifts, loading, unloading etc., complete. Rmtr 245.00

Note : It is assumed that the damage to the steel railing is to the extent of 10 per cent .

APPROVED COPY

Note : For Semi-Government Organisation, Valuers, contractors and public, Schedule of Rates for the year 2018-19 of National Highway Circle, Bangalore may be obtained by paying Rs. 500/- (Rupees Five Hundred only) per copy.

Sd/-
RAGHAVAN
Superintending Engineer,
National Highway Circle, Bangalore

SCHEDULE OF RATES - 2018-19
NOTE

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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Shiradi Ghat, NH 75

NH -67 Bellary Town

